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OUR NORTHERN FRONTIER.

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FIFTH INFANTRY.

NEARLY four hundred years ago, June 24, 1497, the coast of the North American Continent was touched by a brave and sturdy man, and a year later his son explored what is now the coast line of the United States as far south as the Chesapeake Bay. John and Sebastian Cabot were sent out by the English King under charters to discover, claim and occupy lands lying in the direction of what was thought to be the shortest line to the Indies. The spirit of discovery, love of conquest and of adventure, the thirst for riches and honor, and even religious enthusiasm brought thousands of others to the New World from all the countries of the Old; but in North America, of all these arrivals, the English-speaking colonists prevailed, and the greater portion of it became subject to English control.

I.—HISTORICAL.

A glance at any map of North America shows a great division of the Continent into two nearly equal parts; this division is the one made by the great lakes and the St. Lawrence River. That this line should become a boundary line seems natural, and so it became between the colonies which gained their independence in the War of Revolution of 1776 and 1783, and those colonies that remained loyal to the Crown.

The Treaty of Peace of 1783 between the United States and Great Britain did not create the boundaries of the United States, it was only a "treaty of partition of the British Empire," and recognized the boundaries of the colonies as they then existed, in a very indefinite shape. Of necessity this at once became a cause of irritation and contention, and British troops ware still quartered in the United States Territory when Washington sent John Jay, in 1794, to England to negotiate in a conciliatory spirit a new treaty. Even after this step was taken the Governor of Canada made a speech unfriendly to the United States, and three companies of a British regiment marched to the rapids of the Miami to build a fort, in what is now the southern part of Ohio.

Jay's treaty was indefinite, and was at once acknowledged to be a bad one for many reasons, besides leaving the question of boundaries only partially settled; and so an attempt was made by our Government in 1803 to settle the north-eastern and the north-western boundaries, but the British Government did not concur. The treaty of Ghent, 1814, provided for a commission to determine and mark the boundary line from the source of the St. Croix to the St. Lawrence along the 45th parallel, and the treaty of 1818 settled the north-eastern line temporarily, and provided for the north-western line on the 49th parallel. In 1823, 1826 and 1833, attempts were again made, and still again in 1842 and 1846 to settle this disputed question, which engaged the attention of the greatest men of both countries, and which more than once theatened to compel the United States to declare war, in order to maintain her dignity and her rights which were again and again hurt and trampled upon.

The treaty of 1842, called the Ashburton Treaty, confirmed at last the boundary provided in the treaty of Ghent, and gave rise to bitter disputes in England, and the Canadians think to this

day that Lord Ashburton was duped and that he sacrificed their interests.

This treaty was equally attacked in this country, and Webster had to defend it with all his power and eloquence. The entire transaction gives a curious illustration of "diplomacy" as an art, in which, in this instance at least, the Americans were peers of the English.

The question of the north-western boundary was open until the treaty of Washington, 1871, which referred it to the arbitration of the Emperor of Germany. This was to settle the dispute as to the true interpretation of the treaty of 1846. His decision was in favor of the claims of the United States, as indeed were the decisions of other foreign powers, whenever the question of the boundary came up. Thus our "northern frontier," as it now exists, was not agreed upon and determined until nearly a hundred years after the "Declaration of Independence."

II.—GEOGRAPHICAL.

1. Outlines.—In brief, the northern boundary of the United States begins at the mouth of the St. Croix River in Passamaquody Bay, up that river to its source, thence north to the St. John's River, up this to the St. Francis, up the St. Francis to a small lake through which it flows, then south-west to the St. Johns, thence in an irregular course along the highlands which divide the waters falling into the St. Lawrence from those falling into the Atlantic Ocean, to the 45th parallel, and along this to the St. Regis on the St. Lawrence River; from this place to the middle of the river, up the St. Lawrence and through Lake Ontario, Niagara River, Lake Erie, the Lake and River St. Clair, Lake Huron, St. Mary's River, through Lake Superior, to the mouth of the Pigeon River; thence through the small streams and lakes with irregularities to the Lake of the Woods; thence to 49th parallel and along that for 1200 miles to the Gulf of Georgia; thence by the Haro Channel to the Straits of Juan de Fuca to the Pacific Ocean. This great line of frontier is altogether over 3200 miles long, of which length the Great Lakes, connecting rivers with a small portion of the St. Lawrence, cover about 1200 miles. This immense frontier separates us from a friendly people who are descended from the same stock as ourselves, and who maintain the language and general characteristics of our English parentage.

2. Physical Features.—The most striking physical features are the Rocky Mountains in the extreme west, the high rolling prairies, the immense fresh water lakes and their outlet, and the portion of the Laurentian range of mountains which, forming the Thousand Islands, crosses the St. Lawrence and becomes the Adirondacks near Lake Champlain, the Green Mountains of Vermont and the wooded hills of Northern New Hampshire and Maine. Viewing the line as a whole, only about one-third is formed by natural barriers.

III.—POLITICAL DIVISION.

1.—Canada.

As this boundary line throughout its whole extent separates us from Canada, we shall enter into quite a full description of that country.

The Dominion of Canada is the largest and most important of the colonies of Great Britain, having an area of 3,500,000 square miles; it is a semi-independent federation of all the English provinces in North America, excepting Newfoundland. In this federation there are seven provinces and five territories as shown in the following tables:

I. PROVINCES.

Name.	Area in Miles.	Population in 1881.	Capital City.
Ontario,	220,000	1,923,228	Toronto.
Quebec,	188,000	1,359,027	Quebec.
New Brunswick,	27,000	321,233	Fredericton.
Nova Scotia,	20,000	440,572	Halifax.
Manitoba,	123,000	65,954	Winnipeg.
British Columbia,	341,000	49,459	Victoria.
Prince Edward,	2,000	108,891	Charlottetown.

II. TERRITORIES.

Assiniboia,	95,000		Regina.
Saskatchawan,	114,000		Battleford.
Alberta,	100,000	57,000	Fort Macleod.
Athabasca,	122,000		Dunvegan.
Keewatin,	360,000		Fort York.
North, North-East, North-West,	Territories, unofficially named.		

NOTE.—Up to 1883 Manitoba and the Territories had been increased 150,000 by immigration.

The capital of the Dominion is Ottawa, on the Ottawa River, fifty-four miles from Prescott, and abott 115 from Montreal.

The population of Canada as shown by the Census of 1881,

was 4,324,810 souls, of whom 3,715,000 were native-born; the following table gives the nationality of the greater part:

African	21,394	Irish	957,403
Dutch	30,412	Scotch	699,863
English	881,301	Welsh	9,947
French	1,298,929	Swiss	4,588
German	254,319	Scandinavian	4,214
Indian	108,547	Chinese	4,383

It will be noted particularly that though the persons of French descent are so numerous, and form such an important factor in Canadian politics, the English, Irish and Scotch together are nearly double in strength.

Government.—The form of Government of Canada is in theory a monarchy but practically a republic; its legislative power consists of a House of Commons, a Senate, and a Governor-General. The House is composed of 211 members, elected by popular vote for a term of five years. The representation of each province is adjusted on the ratio its population bears to sixty-five which is the fixed representation of Quebec and to its population. The House is presided over by one of its own members elected speaker. There is no property qualification for membership; the only condition is that a member shall be native-born or a legally naturalized British subject. The Senate is composed of seventy-eight members, which number is fixed by the British North American Act, unless Newfoundland should wish to enter the confederation, in which case the number would be increased to eighty-two. The Senators are appointed for life, (*i. e.* during good behavior) by the Governor-General. The qualifications are that a Senator shall be native-born or a legally naturalized British subject: shall possess $4,000 worth of property over and above his debts and mortgages, to be thirty years of age or over, and a resident of the province for which appointed; and in Quebec, a resident of the electoral district for which appointed. A Senator is disqualified by non-attendance at the Senate for two consecutive sessions.

The Governor-General is appointed by the United Kingdom and represents the Queen; his special or independent functions are few. His salary is $50,000 per annum, paid out of the revenues of the Dominion.

The administration of justice is given to judges appointed for life; they may be removed by the Governor-General by ad-

dress of the Parliament. There are superior, district, and county courts, and a supreme court, which is a court of appeal.

The general plan of the confederation has been modeled largely after the constitution of the United States, and the provinces bear nearly the same relation to the federation as the States do to the Union, except the important difference, "that all matters not specially mentioned as coming under the exclusive jurisdiction of the various provinces, belong exclusively to the Dominion."

Finances and Trade.—The debt (funded and unfunded) of the Dominion in 1885, was $264,703,915, drawing interest at an average rate of four per cent. The revenues for the year ending June 30, 1885, were as follows:

From Customs,	$18,935,428
From Excise,	6,449,101
From Public Works, including railways and canals,	3,065,502
From Post-office,	1,841,372
From other sources,	2,505,598
Total	$32,797,001

The expenditures for the same year were $35,037,060.

The total exports in 1885 were $89,238,361; of which about forty-five per cent. went into the United States, and forty-seven per cent. to Great Britain.

The imports in 1885 were $108,941,486, of which nearly forty-four per cent. were from the United States and thirty-eight per cent. from Great Britain. The fishery exports for the same year amounted to $7,976,313, of which about $3,500,000 went to the United States; this latter sum is about eleven per cent. of the total value of all the exports to the United States from Canada.

The banking system of the Dominion is modeled after that of the United States, although not exactly. The decimal system of dollars and cents was adopted about twenty-five years ago. The Dominion is ahead of the Union in having adopted post-office (Government) saving-banks, which hold $15,690,540, in deposits, and an average deposit of $184, for each depositor. The total deposits in all banks on January 1st, 1886, were $104,358,385, of which $32,363,993 were in other saving-banks beside the Government banks. The Canadian banks have enjoyed the highest reputation for security and honesty.

The number of miles of railroad in operation in 1885 was 10,150, of which 1,185 miles are owned by the Government; number

of miles under construction was 2,299. Railway capital, $625,754,704. Gross earnings, $32,227,469; net, $8,212,118. The Government lines were run at a loss of $125,467 in 1885. Subsidies granted by the Government to railways to 1886, $110,283,505.

Canada is almost entirely an agricultural country, but great impetus has of late been given to manufactures and to mineral products; of the latter untold wealth exists in various sections, especially in British Columbia, where rich deposits of the precious metals have just been discovered.

Military Forces.—The military forces of the Dominion are made up entirely of an organized militia, which is under the control of a Minister of Militia and Defense, who is responsible to Parliament. This militia consists of all men between the age of eighteen years and sixty years, who are not disqualified or exempted by law, and who are British subjects; the Government may require a levy *en masse* of all male inhabitants capable of bearing arms to serve in the Army. The militiamen are divided into the following classes, who serve in the order named, *viz.*: 1. Unmarried men and childless widowers from eighteen to thirty years of age. 2. Unmarried men and childless widowers from thirty to forty-five years of age. 3. Widowers with children and married men from eighteen to forty-five years of age. 4. Men from forty-five to sixty years of age. This would give about 1,250,000 men of a military age, of whom about 900,000 are effectives for active service. The Militia is divided into active and reserve land forces, and active and reserve marine forces. The active land force is composed of (1) Corps raised by voluntary enlistment; (2) Corps raised by ballot (draft); (3) Corps composed of both of the first and second classes. The active marine force is raised in the same way, and is composed of seamen, sailors and persons whose occupation or trade is upon Canadian vessels.

Canada is divided into twelve military districts, and these are again divided into brigade, regimental, and company subdivisions.

The table on page 8 is an abstract from the annual report of the Department of Militia and Defense of the Dominion of Canada for the year ending December 31, 1885.

This table shows that in the city there are about 10,600 troops of all arms, which could be called out in a few hours; while in the rural districts there are 27,000 which would require several days to assemble.

TABLE, SHOWING THE DISTRICT FORCES OF THE DOMINION.

Province.	District.	Companies.	Cavalry.	Field Artillery.	Garrison Artillery.	Engrs.	Infantry.	Total.		Grand Total.	Total in Provinces.
								In cities.	Rural.		
Ontario,	1	93	187	240	....	..	4,206	641	3,779	4,633	16,959
	2	129	418	240	112	...	5,639	2,091	4,316	6,407	
	3	70	329	160	45	....	3,099	900	2,601	3,501	
	4	48	83	160	....	....	2,293	473	1,945	2,418	
Quebec,	5	108	417	240	347	89	4,310	1,730	3,673	5,403	11,885
	6	50	....	....	....	....	2,430	510	1,920	2,430	
	7	83	96	80	270	....	3,606	1,005	3,047	4,052	
New Brunswick,	8	50	324	160	260	45	1,717	546	1,960	2,506	2,506
Nova Scotia,	9	75	45	80	569	....	2,952	1,038	2,608	3,646	3,646
Manitoba,	10	12	45	80	....	....	482	427	180	607	607
British Columbia,	11	6	....	....	180	....	90	180	90	270	270
P. E. Island,	12	13	....	....	230	45	342	212	405	617	617
Total,		738	1,944	1,440	2,013	179	30,914	9,753	26,737	36,490	36,490
R. M. C. Cadet Corps,		1	....	....	....	64	.....	64			
Cavalry School "		1	43	....	....	....	. ...	43			
R'g't Cavalry Artillery,		3	....	....	329	....	.. ..	329			
Infantry School Corps,		3	....	....	....	....	319	319			
School Mtd. Infantry,		1	....	....	...	....	105	105	....	860	860
		747	1,987	1,440	2,342	243	31,338	10,613	26,737	37,350	37,350

The Infantry is armed with the Snider rifle, and the Cavalry with the carbine of the same make. The Commanding-General of the Militia acknowledges this to be an inferior weapon. The field artillery is armed with the 16-pdr. muzzle-loading gun. There are some 400 smooth-bore guns, and some 7" and 8" modern rifles for the garrison artillery, beside the special armament of the Halifax forts and of Esquimault.

The term of service in the Militia is three years. The troops of all arms are turned out annually for twelve days' drill, as a rule in brigade camps, under canvas, where they undergo fairly good training; but as one day is consumed in reaching camp, another in leaving it, and at least one Sunday intervenes, the working days are reduced to nine, one of which is employed in marching through town on a holiday parade, and another day is lost in fighting and obsolete sham-fight, so that only seven days are actually available for solid work. Where companies are scattered and only brought together once a year, seven days are not enough for a commander to learn much about his subordinate officers, and still less can he learn about his men. The general commanding the Militia in his report (1885) says that the militiamen do not properly understand the law, as one of the officers in camp had said to him that he (the general) had no *real* authority because the Militia was a *civilian association*.

The strength of a regiment is from six to ten companies of three officers and forty-two men each. The officer commanding the Militia has the local rank of major-general, with a salary of $4,000 a year, and is an officer of the Regular Army of Great Britain. The Militia has a regularly organized staff for its several military districts, and for its brigade and regimental sub-divisions; but the weakest point in the whole military organization is, that it is *without any nucleus of a transport system*.

It must not be supposed, however, that the Canadian Militia is not capable of great efficiency. The Riel Insurrection, in 1885, proved how well and quickly a force was put into the field. In this campaign the orders calling out the first troops were issued on the 27th of March, and on the 30th about 600 troops left Toronto, and arrived in Winnipegoe April 7th and 8th. Towards the middle of April about 5,500 troops of all arms were concentrated in the Saskatchawan country. Some of these troops were sent all the way from Halifax.

The Naval force of the Dominion consists of eight armed

light-draft cruisers and two unarmed dispatch boats; but without even counting these, the entire Navy of Great Britain would be brought to the assistance or protection of Canada in case of necessity. The British Navy will be referred to hereafter.

Canadian Lines of Communications.—The lines of communications are so important that considerable space must be given to their consideration. They are naturally divided into two classes: 1. Those by water. 2. Those by land.

I. Water Communications.—Owing to the treaty stipulations that equally prevent the United States and Great Britain from keeping a fleet of War vessels upon the lakes, the latter power immediately bent its energies to improving the inland navigation system; it was as much military necessity as commercial interests that made Great Britain expend $54,000,000 upon the Welland Canal alone; and other works show similar forethought.

The *St. Lawrence and Lakes* system of navigation is the greatest, and the table, on page 11, of distances from the Straits of Belle Isle to the head of Lake Superior, covering a distance of 2,259¾ miles, of which seventy-one miles are canals, gives the details of the line.

This table is an extract from the official report of the Canadian Minister of Railways and Canals, 1883–'84. It is seen that of all this great line only one canal is in the United States; this is the communication between Lake Huron and Lake Superior by the Sault Ste Marie Canal; it is one mile long, has one lock 515 feet long, 85 feet wide, with 16 feet of water on the sills, and a lift of 18 feet. It is proposed to enlarge this canal so that it shall have one lock 700 feet long, 70 feet wide, 21 feet deep; the construction of which will necessitate the further deepening of the prism of the canal and of the approaches to the lock. All the other canals are under the control of the Dominion Government, and preparations are being made to give a navigable depth of 14 feet throughout the whole chain. Even as the canals were in 1884, light vessels of 9 feet draft could pass through, and changes have since been made to give a navigable depth of 12 feet in all canals having less. The locks of the Welland Canal are 150′ x 26 1-2′; the other canals have locks 200′ x 45′.

It is thus seen that this system necessitates the navigation of the St. Lawrence along the borders of the State of New York, and with guns sufficiently heavy it might be impeded. But there

From	To	Section of Navigation.	Statute Miles.		Least Depth in Channel.
			Intermediate.	Total.	
Straits of Belle Isle	West Point, Anticosti	Gulf of St. Lawrence	441		
West Point	Quebec	St. Lawrence River	385	826	
Quebec	Three Rivers	" " " to tide water	74	900	
Three Rivers	Montreal	" " "	86	986	18 feet at 2 Lock.
Montreal	Lachine	*Lachine Canal*	8½	994½	14 " " 3 "
Lachine	Bauharnois	Lake St. Louis	15¼	1009¾	
Bauharnois	Ste Cicile	*Bauharnois Canal*	11¼	1021	9 feet, to be 12.
Ste Cicile	Cornwall	Lake St. Francis	32¾	1053¾	
Cornwall	Dickinson's Landing	*Cornwall Canal*	11½	1065¼	9 feet, to be 14.
Dickinson's Landing	Farran's Point	St. Lawrence River	5	1070¼	
Farran's Point	Upper End Croyles Island	*Farran's Pt. Canal*	¾	1071	9 feet.
U. End Croyles Island	Williamsburg	St. Lawrence River	10½	1081½	
Williamsburg	Rapide Plat	*Rapide Plat Canal*	4	1085½	9 feet.
Rapide Plat	Point Iroquois	St. Lawrence River	4½	1090	
Point Iroquois	Upper End Presque Isle	*Point Iroquois Canal*	3	1093	9¼ feet.
Presque Isle	Point Cardinal	*Junction Canal*	2⅝	1095⅝	9¼ "
Point Cardinal	Head Galops Rapids	*Galops Canal*	2	1097⅝	9, to be 14 feet.
Galops Rapids	Kingston	St Lawrence	66⅜	1164	
Kingston	Port Dalhousie	Lake Ontario	170	1334	
Port Dalhousie	Port Colbourne	*Welland Canal*	26¾	1360¾	12, to be 14 feet.
Port Colbourne	Amherstburg	Lake Erie	232	1592¾	
Amherstburg	Sarnia	Detroit River and Lake and River St. Clair	76	1668¾	
Sarnia	St. Joseph's Island	Lake Huron	270	1938¾	
St. Joseph's Island	Sault Ste Marie	St. Mary's River	47	1985¾	
Sault Ste Marie	Head of Sault	*Sault Ste Marie Canal*	1	1986¾	16 ft. U. S. Territory
Head of Sault	Pointe aux Pius	River St. Mary	7	1993¾	
Points aux Pius	Port Arthur	Lake Superior	266	2259¾	

is another system entirely within the Dominion, which might become very important, *viz.:* The Montreal, Ottawa and Kingston route, which, extending from the harbor of Montreal passes through Lachine Canal, the lower Ottawa River, the Ottawa Canals to the city of Ottawa, thence by the Rideau River and Rideau Canal to Kingston on Lake Ontario. The total length of this system is 245 5-8 miles, of which 126 1-4 miles (the Rideau navigation) have a navigable depth of only four and one-half feet; and in this there is great difficulty in keeping the water to its proper level.

The third system is the Trent River navigation, which is of little importance now, but it may, in studying the military question become of strategic importance. This system is briefly as follows: from the Bay of Quinté on Lake Ontario through the River Trent, Rice Lake, Otonabee River, Lakes Clear, Buckhorn, Chemong, Pigeon, Sturgeon, Camero, Balsam, by a canal and Talbot River to Georgian Bay, Lake Huron, distance 235 miles.

In connection with this is the Murray Canal, which is being constructed across the Isthmus of Murray, connecting the head of Quinté Bay with Lake Ontario. This cut is four and one-eighth miles long, and will have a depth of eleven feet below the lowest known water level of the lake, and a width at the bottom of eighty feet. It has no locks.

The fourth system is that of the Richelieu and Lake Champlain, which commences at Sorrel at the confluence of the Richelieu and Saint Lawrence Rivers, forty-six miles below Montreal; it extends along the Richelieu through the Saint Ours Lock to the Basin of Chambly, to the Chambly Canal, to St. Johns and the River Richelieu to Lake Champlain. From Sorrel to the boundary line is eighty-one miles, from there to Lake Champlain Canal 111 miles, Champlain Canal to Albany seventy-three miles, Albany to New York City 146 miles. Total, 411. The canals have a navigable depth of seven feet at low water.

II.—Land Communications.—The details of the railways of Canada as to their facilities for transporting troops and war materials are given below; they form a net-work in the older provinces.

1. The *Intercolonial Railroad* extends from Halifax to Quebec along the coast of New Brunswick, and the St. Lawrence to Levis Point, opposite Quebec; it is owned and operated by the Government; it cost $41,176,654; it is laid in steel rails of fifty-

six to sixty-seven pounds; the heaviest grade is sixty-five feet to the mile, and the shortest curve 694 feet radius; length of main lines, 678 miles; there are several important branches; it is well equipped, had 163 locomotives; 143 passenger cars (1st and 2nd class); forty-seven baggage, smoking, postal and express cars; 1,457 box cars; seventy-two cattle; 1,441 platform; 1,350 other kinds; and thirty snow, and ten wing plows.

2. The *New Brunswick Railroad* is a private corporation, having Government subsidies amounting to $306,000; and a branch from Fredericton Junction to the Intercolonial road is further subsidized $128,000. It extends from St. Johns, N. B., to Vanceborough, ninety-one and a half miles; and from St. Andrews to Edmondston, 207 miles; the branch has 108 miles; it has some iron and some steel rails. The rolling stock of the combined roads and branch is: twenty-five locomotives, twenty-four passenger cars, two baggage and express cars, and 437 freight cars.

3. *The Grand Trunk Railroad* is the largest under one management in Canada; it has a Government subsidy of $756,000, together with a loan of $15,142,633. It extends from Montreal to Point Levis 172 miles, from Montreal to Lennoxville 104 miles, Montreal to Rouse's Point fifty miles, Montreal to Mooer's Junction, fifty-one miles, Montreal to Toronto 333 miles, Toronto to Point Edward 195 miles, Toronto to Windsor 229 miles, Point Isadore to Fort Covington fifty miles.

The total length of main line and branches not mentioned above is 2,071 miles. The greater part is laid with 66-pound steel rail, and 2,640 ties to the mile. The rolling stock is as follows: 592 locomotives, 461 passenger cars (1st and 2nd class), 121 mail bags and express cars, 12,556 box and stock cars, and 3,601 flat cars. The road is of very great capacity, and upon it are the most important strategic points.

4. *The Canadian Pacific Railway* extends from Montreal to Port Moody on the Pacific Coast 2,893 miles; it is entirely completed and in running order; the Government loans, including land-grants, amount to $72,500,000; most of the road is laid with 56 and 60-pound steel rails. It is a well-constructed road, and offers good rates to settlers for the transportation of their farming implements and household goods. The rolling stock is 254 locomotives, 133 passenger cars (1st and 2nd class), 58 baggage, mail and express cars, 2,172 stock and box cars, 4,226 flat cars, and 35 parlor and sleeping cars.

5. *The Canadian Southern* extends from Windsor to Suspension Bridge; it is now operated by the Michigan Central in connection with the New York Central and Hudson River Railroad. This road has received Government aid. Its rolling stock is 125 locomotives, 47 passenger cars (1st and 2nd class), 24 baggage, mail and express cars, 2,039 cattle and freight cars, 472 platform and 63 hoppers. The length of the main line is 226 miles.

Besides the systems given above there are various small cross-lines that would become valuable in case of hostile operations. For the entire population the Dominion is well supplied, having one mile of railroad for every 426 persons, or considering only the older provinces one mile for about every 600 persons.

Shipping.—In connection with the means of communication a statement of the shipping must be made, and here again the Dominion shows great strength as she ranks fourth in the world in her merchant marine; the number of registered vessels on January 1st, 1885, being 7,315, measuring 1,231,856 tons, valued at $37,000,000, and manned by about 65,000 men. This fleet is largely engaged in the fisheries, which in 1885 reached a total value of $17,722,973.

It is seen that the Dominion is able to abundantly provide transportation for any military forces both by land and by water.

Leaving here the statistical part of Canada, we come to her immediate neighbors, *viz.*, the States and Territories touching the border.

II.—The United States.

The following table gives the statistics of each State and Territory:

Name.	Area.	Population 1880.	Organized Militia.	Total, Available for Military Service.
Maine.....	33,040	648,936	1,225	93,437
New Hampshire....	9,305	346,991	1,333	23,881
Vermont.....	9,585	332,286	693	44,366
Massachusetts.....	8,315	1,636,937	4,145	272,003
Rhode Island.....	1,250	276,531	1,270	47,000
Connecticut.....	4,990	622,700	2,324	78,869
New York.....	49,170	5,082,871	12,509	555,042
New Jersey.....	7,815	1,278,033	3,535	223,914
Pennsylvania.....	45,215	4,282,891	8,477	478,147
Ohio.....	44,060	3,198,062	5,843	440,000
Indiana.....	48,720	1,978,301	3,512	463,134
Illinois.....	56,650	3,077,871	3,839	440,000
Wisconsin.....	56,040	1,315,297	2,593	175,000
Michigan.....	58,915	1,636,937	2,335	250,000
Minnesota.....	83,365	780,733	1,426	140,000
Dakota.....	149,100	135,177		
Montana.....	146,080	39,159		
Idaho.....	84,800	32,610		
Washington, Ty....	69,180	75,116		
Total...	862,575	26,777,679	54,859	3,684,773

This table shows that within an area about one-fourth the size of Canada the population is five times as great, the organized State Guards are one-third stronger, and there are four times as many men available for Military Service.

The following tables give the statistics of the Merchant Marine of the same States:

I. TABLE.

(Extract from the Annual Report of Bureau of Navigation, December, 1886.)

State.	Sailing Vessels.		Steam Vessels.		Canal Boats.		Barges.		Total.	
	No	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
Maine	2,356	464,510	119	22,242	....	.....	2	82	2,477	487,574
N. Hampshire	59	10,562	7	388	....	.....	....	.....	66	10,891
Vermont	13	1,062	8	2,318	12	1,211	....	.....	33	4,591
Massachusetts	1,902	370,925	156	68,941	....	.....	10	2,971	2,068	442,838
Connecticut	522	45,959	148	36,565	2	251	165	25,896	835	108,672
Rhode Island	226	18,577	44	21,209	....	.....	....	.....	270	39,786
New York	2,808	564,764	1,274	457,038	68	9,118	514	106,193	5,564	1,127,113
Pennsylvania	543	136,104	461	133,796	44	5,822	32	6,693	1,080	282,416
Ohio	166	65,820	252	96,642	....	.....	6	2,172	424	164,634
Indiana	.....	.....	60	8,728	....	.....	....	.....	60	8,728
Illinois	226	52,446	177	21,076	....	.....	....	.....	403	73,522
Michigan	504	99,008	511	110,859	....	.....	56	16,529	1,072	226,391
Wisconsin	245	51,634	150	31,391	....	.....	....	.....	395	83,025
Minnesota	1	88	64	6,665	....	.....	13	1,615	78	8,369
Washington, Ty	87	4,352	79	9,424	....	.....	....	.....	166	49,776
New Jersey	924	61,491	105	13,688	1	279	48	13,954	1,078	89,412
Total.	10,582	1,947,242	3,605	2,340,970	127	16,681	846	176,105	16,068	3 297,738

The following table shows the distribution of all the shipping of the United States:

II. TABLE.

Atlantic and Gulf Coasts.	14,354	1,860,059	2,671	773,443	56	9,252	746	148,290	17,827	2,791,044
Pacific Coast	856	200,696	404	153,939	....	.....	8	5,973	1,268	360,608
Northern Lakes	1,322	313,129	1,175	335,859	71	7,150	111	30,810	2,379	749,949
Western Rivers	.....	.....	1,149	231,676	....	.....	140	114,378	1,289	346,059
Total	16,532	2,373,874	5,399	1,525,107	127	16,402	1,005	299,451	23,763	4,247,660

The following table gives statistics of some of the important railroads of the United States, in the States, under consideration:

Name of Road.	From,	To.	Miles Operated.	Locomotives.	Passenger Cars.	Mail, baggage and Express.	Freight and other.	Remarks.
Maine Central	Bangor	Vanceborough	351.00	57	58	25	1,168	Branch to Bar Harbor, &c.
Boston & Maine	Boston	Portland	201.84	80	130	32	1,458	" " Saco, Gloucester, &c.
Portland & Rochester & Worcester & Nassau	Portland	Nassau	146.98	26	31	11	521	Through Towns on Coast.
Old Colony	Boston	Newport	453.96	104	288	55	1,933	Branches to New Bedford, Fall River, &c.
New York & New England	"	New York	282.31	87	119	30	1,860	" " Fishkill Landing & Prov., Norwich.
New York, New Haven & Hartford	New York	Hartford	152.10	97	198	60	1,555	Connect with above.
New York, Providence & Boston	"	Boston	132.18	27	31	13	266	" " " and Shore Line.
Boston & Albany	Boston	Albany	324.47	248	187	48	5,710	Through Massachusetts.
Connecticut River	New Haven	Canada	223.27	20	35	5	392	" Connecticut River Valley.
Long Island	Brooklyn	Sag Harbor	320.00	53	209	18	356	Branches on Long Island.
New York Central & Hudson River	New York	Buffalo	993.29	601	367	131	18,436	Perfect Net-work over State New York.
New York & Harlem	"	North	.....	38	71	31	959	Through New York State.
Pennsylvania	"	Pittsburg	1,806.13	1,004	739	186	20,411	" New Jersey & Pennsylvania.
Philadelphia & Reading	"	Westward	850.40	448	367	44	19,886	" " " " " "
New Jersey Southern & New Jersey Central	"	Philadelphia	.....	303	263	85	2,268	" " " " "
C. A., P. A., & West Jersey	Philadelphia	Atlantic City	248.02	47	172	32	424	" " "
P. W. & B., & B. & P	"	Washington	220.29	103	178	54	1,584	" " " Delaware, Maryland & Penn.
Baltimore & Ohio	Washington	New York	1,528.35	547	248	87	13,680	" same States & Ohio & Illinois.
Boston, Concord & Montreal	Boston	Montreal	166.30	30	30	17	596	" New Hampshire.
Central Vermont & Connected Lines	St. Albans	.....	466.75	109	68	28	2,033	" Vermont.
Grand Trunk (Extension)	.....	.....	150.83	...	...	...	.....	" " & New York.
Portland & Ogdensburg	Portland	St. Albans	211.36	9	16	4	173	" Maine, N. H. & Vermont.
Delaware & Hudson Canal Company	Albany	Montreal	617.57	36	6	6	67	" Vermont.
Ogdensburg & Lake Champlain	Ogdensburg	St. Albans	118.00	33	10	6	973	" New York.
Utica & Black River	Utica	Clayton	180.49	18	23	10	210	" " "
Lake Shore & Michigan Southern	Buffalo	Chicago	1,177.67	497	168	80	12,432	Along South Shore Lake Erie.
Chicago & North-Western	Chicago	St. Paul	4,000.00	368	185	87	10,375	Through Wisconsin, Minnesota, Iowa, & Dakota.
Chicago, Milwaukee & St. Paul	"	"	4,000.00	341	159	109	8,863	(Mileage Estimated).
Michigan Central	.....	.....	789.72	219	116	35	5,986	" Michigan.
Chicago, Burlington & Quincy	Chicago	St. Joseph	3,000.00	374	140	70	11,974	In Ill., Iowa, Mo. & Neb. (Mileage Estimated).
Wabash, St. Louis & Pacific	Toledo	St. Louis	1,635.73	294	107	81	6,854	" Ohio, Indiana & Illinois.
St. Paul & Manitoba	St. Paul	.....	656.00	65	42	27	1,232	" Minnesota.
St. Paul & Sioux City	"	Sioux City	548.74	39	20	20	2,082	" " & Iowa.
Northern Pacific	"	Portland	2,967.30	64	29	15	1,826	" Dakota, Montana & Washington Ty.
Illinois Central	Chicago	Cairo	1,306.18	212	122	56	5,133	" Illinois.
Chicago & Alton	"	St. Louis	840.56	196	64	29	4,457	" "
Detroit Lines, D. G. H. & M. / D. & B. C. / D. H. & S. W. / D. L. & N.		Detroit	656.43	81	59	20	1,666	" Michigan.
Chicago, R. I. & Pacific	Chicago	Kansas City	2,000.00	276	113	40	6,798	" Ill., Mo., Iowa, & Minn. (Mileage Estimated).

The roads mentioned in this table are only a few of the roads that form the complete net-work in the Northern States; the statistics of their equipment are taken from the Report of Transportation of the Tenth Census, 1880. The mileage is partly taken from the *Travelers' Official Guide*, and the roads having the remark "estimated" are known to be continually extending their enormous systems, so that only the approximate mileage can be given.

The following table gives some of the Canals in this section of the country:

TABLE.

Name.	From.	To.	Length—Miles.	Width—Feet.		Depth—Feet.
				Surface.	Bottom.	
Lake Superior Ship Canal	Lake Superior	Portage Lake.	2.12	100	....	14
St. Mary's Falls	.....	.....	1.02	100	....	17
Illinois and Michigan Ship Canal.	Chicago	La Salle	102	60	....	6
Ohio Canal and Feeders	Cleveland	Portsmouth	323	40	26	4
Miami and Erie	Cincinnati	Toledo	284.25	50 & 60	....	5½
Erie Canal	Albany	Buffalo	395.07	70	52½	7
Oswego Canal	Syracuse	Oswego	38	70	56	7
Champlain	Whitehall	Waterford	81	58	44	6
Delaware and Hudson	Honesdale, Pa	Rondout, N.Y.	111	48	32	6
Delaware and Raritan Canal	Bordentown	N. Brunswick	43	80	....	7
Ship Feeders	Ball's Island	Trenton	22	60	....	6

The most important canals in this table are the Erie, Oswego, Champlain, Illinois and Michigan, Lake Superior, and the Sainte Mary's Falls. The last two have the greatest depth, and are very short. The Erie has a depth of seven feet, and its seventy-two locks have each a length of 110 feet and a width of eighteen feet. The Champlain has a depth of six feet, and its thirty-three locks are of the same dimensions as the Erie. The Ohio Canal and the Miami and Erie are altogether out of the question as to being able to furnish water-way for any gunboats from the inland rivers or sea-board to the lakes. We here see at once at what disadvantage we are in this respect. It amounts to this, that even if the United States had light draft gun-boats and torpedo-boats on the sea-coast, they would not be available on the lakes unless they were less than 110 feet long, 18 feet beam and seven feet draft.

Roads.—The roads of this section are generally good, but the

means of communication by rail are so abundant that the country roads will probably only be used for very short distances.

The climate of the section varies from the extreme dry cold of Montana and Dakota in winter to the piercing dampness of the seacoast, and from the intense heat of summer in the former to the cool breezes of the St. Lawrence Valley and the Ocean. Statistics show that the navigation of the canals and lakes closes about December 1st, and opens again about May 1st. Rains in the spring and autumn make the roads heavy and swell the streams to overflowing, and the cold and snow of winter render campaigning difficult in that season, but not impossible. Columns of the United States Troops of cavalry and infantry, with their heavy trains, have braved in very recent years, the winters of Motana from six to eight weeks in the field with the temperature ranging to sixty three degrees belew zero, making marches of from twenty to thirty miles a day over a perfectly wild country.

As compared with Canada alone, it is not necessary to enumerate the wealth and great resources of the states of our Northern Frontier, and as military operations in Canada would only result from a war with England, we shall have to consider the present conditions of England and the entire United States for such an event.

I. England.

In simple figures the Peace establishment of the British Army for 1884–'5 was as follows:

Cavalry (officers and men)	16,998
Artillery (officers and men)	34,041
Engineers (officers and men)	5,723
Infantry (officers and men)	134,401
Colonial Corps (officers and men)	2,489
Administrative Corps (officers and men)	8,253
Total regulars. Total	201,905
Regular Army Reserve	50,750
Militia	150,930
Volunteer Forces	247,661
Indian Native Army	120,882
Total War Strength	772,128

With the regular forces are 23,283 horses, and 584 cannon. Besides the forces there are 14,000 armed constabulary in Ireland, and a native military police of about 190,000 men in India.

Of the regular forces 107,818 men were in the United Kingdom, 61,591 in India, about 15,000 in Egypt (September, 1884) and the remainder in other colonies. Gibraltar and Malta usually have garrisons of a little over 5,000 men, and Halifax 2,268 men. This is a great force, and is, of course, capable of expansion. There is one fact connected with the British Army to-day that is notorious—the transport and supply services are inefficient, if not absolutely corrupt. It seems almost unnecessary to refer to the recent discussions in the English press that bayonets, sabres, swords, gun-barrels, and armor-plating were soft, powder inferior, flour mouldy, and contractors furnished for the Egyptian campaign bales of hay filled with bricks and stones; the Government did not satisfactorily contradict or explain this condition of affairs.

More interesting to the United States however, in event of War, would be the British Navy, of which a small portion would engage our whole attention for months.

The personnel of the Navy is as follows: (Estimates, 1883–'84):

Seamen	40,554
Boys	4,804
Marines (one-half afloat)	12,400
Royal Naval Reserve	21,750
Total	79,508

There are 73 armored vessels, 309 steamers and 147 sailing and ponton boats. The stations were as follows: (in 1884) 133 in British waters, 23 in the Mediterranean, 19 in China, 19 on the east and west coast of America, 4 in Brazil, 10 in India, 9 in West Africa, and 9 in Australia. Total in commission, 226. Of the armored vessels 57 are fine sea-going cruisers, armed with the most improved long-range rifle cannon, mostly breech-loading, and fitted out with all appliances for detecting and removing torpedoes, or, when necessary, of using them. The guns have a range of from four to ten miles. 10 guns of a possible range of ten miles were afloat on the ships *Conqueror*, *Colossus* and *Edinburg* in July, 1885, and 28 more were to have been afloat shortly after. The calibre of these guns is from 12" to 17". All ships in the British Navy styled gun-boats have a complement of rapid firing and machine guns which could be efficiently used by a force after making a landing.

In addition to the Naval establishment England possesses an immense transport system in her merchant marine, all the details of which for War purposes have been carefully worked out. She could immediately make available such ocean greyhounds as the steamers of the Cunard, Guion, White Star and Inman lines. Many of these steamers are officered and manned by officers and men of the Royal Navy Reserve, who thus are always keeping up in their practical duties.

As in the event of War, operations would be commenced by a naval attack, let us examine briefly the vantage ground already possessed by England. Pending the declaration of War, without any protest from us being listened to (even if we made one) she could concentrate one-half of the vessels in commission in English waters, at Halifax, St. Johns, N. B., Quebec, or Montreal and Bermuda, and reinforce her Pacific Coast fleet by vessels in the Asiatic waters. She could safely transport by the ocean steamship lines named, from 75,000 to 100,000 of her regular army now at home stations, leaving to her Militia the care of her own coasts. Her principal concentration would be at Halifax and Montreal, at which points she could have immense forces (compared to ours) in fifteen or twenty days from the time they received their orders. And on the Pacific Coast she would concentrate at Victoria, Vancouver.

After all that has been written in such valuable papers as have lately appeared upon the subject of our sea-coast defenses, and on our fortifications, it hardly seems necesssry to point out again the places that are absolutely at the mercy of the British armor-clad cruisers; but to make this paper as complete as possible it will be necessary to outline some of the operations that England would at once undertake. In her Navy she has 111 vessels that are available for service upon the lakes, so that with the perfection of her canal system the treaty stipulations that the United States and Canada shall each keep but one naval vessel on the lakes is practically a dead-letter; with the slightest forethought on the part of England, she could have a large number of these vessels on the lakes in from two to five days after the declaration of War. Three of these four vessels are armored, each carrying two 7" M. L. rifles and two howitzers; three are torpedo vessels, and the rest are gun-boats and gun-vessels, all armed with guns of large calibre. This fleet would be assembled partly at Montreal and partly at Quebec, and would at once threaten all our lake cities, or at least

those on lakes Erie and Ontario. for we might possibly be able to obstruct the Detroit and St. Clair Rivers, and save the cities on the upper lakes. Forty-three of these vessels draw less than seven feet of water, and some would immediately pass through the Richelieu River and Chambly Canal to Lake Champlain ; this naval force would be auxiliary to a land force that would approach the frontier of New York from Montreal.

From Halifax and St. Johns, N. B., a strong naval force would threaten the important cities from Eastport, Me., to Hampton Roads, and so absolutely defenseless are all these cities that they would be placed under tribute to the amount of millions of dollars. Captain Griffin, of the Engineers, in his valuable paper on "Our Sea-coast Defenses," in an important table shows that in the cities of Portland, Boston, Cambridge, Newport, New York, Jersey City, Brooklyn, Philadelphia and Baltimore alone there are over four thousand millions of dollars worth of destructible property, and it is also shown that each of these cities can be bombarded by any one of the powerful English iron-clads, against the armor of which the shot of the few light guns that we have in position, even if the ships came within their range would act only like a coarse towel on the human skin after a bath —very much like a comfortable irritant to send a healthful glow through the veins of the British tars, stimulating them to quicker action. It is no exaggeration to say that the total sum that would be exacted by our enemy from these cities would not fall short of five hundred millions of dollars. Germany exacted from France 1,000 millions of dollars in 1871 ; and the United States would probably pay twice that sum as a result of the defenseless condition of her sea-coast and lake cities. New York City alone would pay 250 to 300 millions of dollars to spare herself from receiving half-a-dozen unwelcome visitors in the shape of the 1800-lb shells loaded with explosive gelatine. In the natural order of events all these exactions would fall upon the country at large. In addition to the attack upon the cities, England would send some of her fleet to occupy Gardiner's Bay at the eastern end of Long Island, the occupation of which would be of the highest stragetical importance, as it would furnish the enemy with a secure harbor for his transports, and it would serve as his most important base of operations, not only for preying upon our commerce, but for renewing his attack upon our cities, and supplying and re-enforcing his land forces. From St. Johns, N. B., England

would send a land force into Maine, and thus secure control of the railroads even as far as Portland, where she would already have had some of her iron-clads. From Bermuda she would send her vessels to lay the cities of the South Atlantic and Gulf Coast under tribute, and finally from Victoria she would send them to San Francisco, and Portland, Oregon. On the entire frontier the only point at which the United States possesses the whole advantage is Minnesota and Dakota, where we could quickly send a force to invade Manitoba, and cut off communication with the extreme west. In addition to the bases of operations named, Kingston, Toronto, and Hamilton would serve as bases upon Lake Ontario for naval operations; and as every effort would be made to keep the Welland Canal intact, they would also serve as bases for operations on Lake Erie. The Ordnance stores and War material possessed by the English and at the disposal of Canada, and the perfect system of navigation and railroad communications from Montreal, which is only fifty miles from Rouse's Point, would soon place the whole of Northern New York under control of the enemy. This would include the two frontier railroads and the city of Ogdensburg.

II.—The United States.

The last annual report of the Lieutenant-General commanding, gives the strength of the Army as 2,102 officers, and 23,946 men, distributed in the military divisions and departments as follows:

Military Division, Atlantic	344 officers and 2,645 men.
Department of the Platte	242 officers and 2,782 men.
Department of Dakota	330 officers and 3,929 men.
Department of Missouri	255 officers and 2,859 men.
Department of Texas	167 officers and 2,193 men.
Department of California	91 officers and 810 men.
Department of Arizona	320 officers and 4,483 men.
Department of Columbia	139 officers and 1,637 men.

At garrisoned posts on the sea-board north of Hampton Roads, and on the northern boundary there are 143 companies of troops of all arms, numbering 693 officers and 6,498 men; this does not include the Engineer School of Instruction at Willett's Point, nor the United States Military Academy at West Point. Within a journey from the frontier of from twenty-four to thirty-six hours, by rail, there are twenty-one companies numbering 115 officers and 1,200 men in the Department of the Missouri; eighteen companies numbering seventy officers and 900 men in the Depart-

ment of the Platte; and nineteen companies numbering sixty-seven officers and 900 men from the Department of Dakota (besides those in this Department already on the frontier); making altogether 894 officers and nearly 10,000 men, who would be ready in a few hours. The troops from the Departments of the Missouri and the Platte, numbering over 2,000 men would be at Chicago in the time above stated, and in from ten to fifteen hours more would be at Detroit, Port Huron, and Buffalo, and some of them even reach Ogdensburg.

The latest returns received at the Adjutant-General's office give the strength of the organized Militia of the country at 81,710 officers and men, with 6,786,995 men available for military duty (unorganized). It is safe to say that one-half of the militia or forty thousand men would be under arms and on the frontier inside of twenty-four hours.

In addition to the garrisoned posts, where enlistments may be made, there were in operation on October 1st, 1886, recruiting rendezvous at the following places: Four in New York City; two in each of the cities of Philadelphia, Baltimore, Chicago, Cincinnati and St. Louis; and one each in Boston, Albany, Buffalo, Harrisburg, Pittsburg, Cleveland, Detroit, Denver and Washington. These rendezvous would play an important part in case of hostilities, in recruiting men at once for the Army.

The Navy, according to the annual report of the Secretary, 1886, consisted of ninety vessels, of which nineteen are iron-clads and two torpedo-boats; these vessels carry altogether 542 guns. There are on the active list, 1,769 officers of all grades, 7,500 men, and 750 boys. The marine corps consists of eighty-one officers and 2,014 men. For the purpose of expanding the naval force the following men by their occupations are available, and would make the finest kind of material for our volunteer Navy (from census of 1880):

Boatmen and watermen	20,368.
Canal men	4,329.
Sailors	60,070.
Steamboat men, (estimated women so employed not counted.)	8,250.
Stewards, (" " " " ")	16,500.
Fishermen and oyster men	41,352.
Raftsmen, (estimated.)	10,000.
Engineers and firemen, (estimated.)	25,000.
Pilots	3,770.
Total	189,639.

It does not seem necessary to speak of the vast resources of the country; we know that we have within our borders all the materials that are needed, not only for equipping a great Army and Navy, but for living independently of any foreign nation; for it will be noted that most of the imports into the country of late years have been what may be classed as luxuries, and not necessaries of life. It has been proved within a few months that we have the means of manufacturing as fine, if not finer, a quality of iron and steel as any other nation, and that in a few months the great steel works could put out steel plates and ingots of almost any desired size. Our manufacturers enable us to completely clothe ourselves, and our agricultural products not only feed us without assistance from abroad, but enable us to send a large surplus to the insufficiently fed nations of Europe.

In the matter of small arms and explosives the country is able to furnish any amount, but of course time is required. According to the surplus of manufacture, of the Springfield B. L. rifle cal. 45, over issues of the same during the last four years, the Government is probably able to arm at once 100,000 men. The Government works can be made to turn out 1,000 of these rifles per day, and private arms companies can probably furnish 3,000 rifles and revolvers per day. The latter companies can supply 2,000,000 cartridges per day. The Government works can furnish 1,000,000 more per day, and besides are fully able to supply all demands for ammunition for field and heavy guns. The manufactories of explosives would supply all the powder and other explosives necessary to keep up with all requirements. It is thus seen that every week we could arm and equip about 20,000 men; and every week's delay would be so much to our advantage.

It must not be supposed that armed men alone, however brave and willing, enthusiastic and patriotic, constitute an army; organization, discipline and leadership are essential, and the first and second must be perfected before the last can avail anything.

The results of the last War show that, with the utmost care and incessant labor, from six weeks to two months were necessary to organize and drill each regiment of volunteers so that the colonel could say that he knew something of his men; and a colonel must know his men, and they know him, before he can lead them. The War was of such a grand scale, and such wonders were achieved both North and South, that we think we are naturally a nation of soldiers, and can accomplish anything. To a great ex-

tent we are; there are no men so easily amenable to law and to orders as are Americans (*that's discipline*); and it is because they see almost intuitively the right and justice of the thing, and exercise their intelligent thoughtfulness. These are the men who formed the "Blue and Gray" lines, and who were equaled by no other soldiers of the world. We think to-day that at the clarion's call these men so perfectly organized and disciplined would spring at once to arms, and would march forth to meet the foe. The spirit and enthusiasm and loyalty to do so are all there; but a generation has passed away and another has grown up in the twenty-two years since those grand Armies dissolved, in 1865, and went back to their farms, machines, and books. Many of those heroes have gone to join the shadowy hosts beyond—Grant, and Hancock, and Lee - and of those who live many are too old to take an active part, and although willing to do so, must be content to plan and advise. To go to some unpleasant facts, there are no field officers of Cavalry or of Artillery to-day (June 1st, 1887) under forty-five years of age, and only one of Infantry in the whole line of the Army. There are seventeen captains of Cavalry only, of all the captains of the Line, under forty years of age. This shows chiefly that the leadership in our next War will fall largely upon those who are lieutenants now. This fact should be some consolation for the slow promotion that exists. It is a lesson of patience; and a patient lieutenant of to-day must think of preparing himself for the trial test whenever it comes; patience, study, and thought—he requires all of these. Then let him be *ready* and willing when called, and he cannot fail.

Part of this question is: Can England, in the near future, wage War against the United States? That she would be willing to, seems almost beyond question; monarchy has no love for democracy; it is every hour of the day shown in the tyranny of the Czar, in the prejudices of the English lord and of the titled nobility of the Continent. The English aristocracy despise the demoratic-republican American, and no "news would be so welcome to the English nobility as the downfall and failure of the 'Great Republic.'" This was demonstrated during the late War, when everything was done to encourage the South and to prejudice public feeling against the North. This was the work of the aristocratic clubs of London. Thank God, the independent commoners sympathized with the North and wanted freedom to triumph!

Every year that passes places the Republic ahead of England

in everything, and hence her hostility; her power and wealth and influence among the great nations are menaced; sometimes she may think her rights infringed upon, and so seek a cause of War and the payment of a large indemnity. But even for an indemnity, could she afford a War? The United States exported to England and her colonies (not including Canada), in 1885–86, merchandise to the value of $375,398,777, and imported therefrom articles to the value of $188,704,352. That is, that of our total exports she took 51.27 per cent., and of our total imports she furnished 24.28 per cent. If Canada be included the figures would be 56.38 per cent. and 30.19 per cent. respectively. This further means that the United States furnishes about one-fifth the articles imported by England, and in return is the best purchaser of England's products, such purchases being more than 2½ times greater than the purchases made by the United States from any other country. Of our exports to England, by far the greater portion is in the shape of food. It is estimated that 12,000,000 of the people in Great Britain, or one-third of her entire population, already live on imported food. War would mean cutting off of a large portion of this food from the masses of England, the stoppage of the great carrying trade between the two countries—which gives employment to thousands of people—and also the shutting down of many of England's factories. A War indemnity would certainly not supply food and labor to the commoners. Even at the best, it would be an expensive luxury for England to undertake, and, overwhelmed as she is with debt and with discontent and starvation at home, and Russia threatening in the East, she could hardly afford it.

The policy of the United States being entirely peaceful and non-aggressive, England would never have to defend Canada against the United States to prevent conquest; and even if she attempts it, she could not prevent conquest. But the future of Canada is more and more intimately interwoven with the States, and her interests are greatly dependent on them. As Canada increases in wealth and population she may, and undoubtedly will desire to become totally independent of England, and may even desire annexation to the United States; neither of these could England prevent, and it is certain that independence will eventually occur.

If, however, some unforeseen circumstance should bring about hostilities between the two countries, the United States would be

forced to make an offensive defense by an invasion of Canada, as the most important of England's colonies. The following would be about the general plan of operations:

First.—Pending the declaration of War, every effort would be made to protect our important sea-ports which are absolutely defenseless. It seems that the question ends here *per se*, so hopeless does it look. The order of urgency of these ports is as follows:

1, New York; 2, San Francisco; 3, Boston; 4, Lake Ports; 5, Hampton Roads; 6, New Orleans; 7, Philadelphia; 8, Washington; 9, Baltimore; 10, Portland, Me.; 11, Rhode Island ports.

The few iron-clads, obsolete as the are, would be distributed at these ports, except those on the lakes, which they could not reach. Officers of the Army and Navy, who have been instructed at the torpedo schools at Willetts Point and Newport, would be assigned to duty at these and other important places to plant the torpedoes now on hand, and to improvise and construct others. These would be planted as already planned in confidential papers held at these schools, and in the War and Navy Departments.

The recruiting officers in cities would be ordered to enlist as many men as possible for assignment at once to the regular batteries, and to the regiments of Cavalry and Infantry, the companies of which would be filled to the maximum of 100 men each. The National Guards of all the States would be called at once into the Service, without further recruiting, and would await orders from the President for their disposition.

The President would at once call for as many volunteers as would be deemed necessary for the Army and Navy.

Regular troops would be massed at four or five points on the frontier, *viz.:* At St. Vincent, Minn., Detroit, Mich., Buffalo, Ogdensburg, and Rouse's Point, N. Y. Upon the declaration of War the troops should be ordered to occupy and hold at all hazard Windsor opposite Detroit, Fort Erie opposite Buffalo, and Prescott opposite Ogdensburg; a bold dash by some picked men would probably give us the possession of the four bridges across the Niagara, *viz.:* The Suspension Bridge, Cantilever and the International Bridges, and the small Suspension Bridge. The troops taking possession of Fort Erie should make a desperate effort to reach and destroy the Welland Canal, or disable it as far as possible; and the troops from Ogdensburg should attempt the destruction of the Point Iroquois, Junction and Galops

Canals; the latter is only seven and three-eighth miles below Prescott. That this might be done by a fearless commander is highly probable, for it was along this portion of the frontier that the Fenian raids were successfully made.

The troops from Detroit should construct earthworks at Windsor, and also occupy Sarnia and Courtwright, and the commanders at these three places should be made to understand that there was to be no such thing as withdrawal or surrender. The troops from St. Vincent should move to Winnipeg, and hold that point to sever connections by the Canadian Pacific with the extreme West. Troops should be sent to Bangor, Me., to concentrate there a large portion of the National Guard of that State, and if any delay occurred in the operations of the Canadians, these troops should at once move toward Vanceborough, and, if possible, to MacAdam, N. B.

In our different sea-coast and lake ports every effort should be made to construct batteries, some of them floating armor-clad batteries, and also torpedo boats; these would necessarily have to be armed with the poor material we have at hand. Our condition would certainly be hazardous, but even a chance shot might give us the delay needed, and every day's delay would add to our strength. As the State troops assembled they would be sent to reinforce the regular troops, especially those on Canadian soil; and as the volunteers were organized and drilled they would relieve the State Troops, for in the end it would be the volunteers upon whom the great efforts of the struggle would fall.

Further details are not necessary, nor are they advisable; let us hope rather that even those outlined will never have to be undertaken.

Before closing this paper, the writer may be permitted to express his views upon ths present situation, especially in connection with the recent retaliatory measures against Canada.

First.—The United States is not in a position to-day to enforce retaliation, which certainly means *War with England.* Our richest cities are not at all defended, and we have no Navy to protect our own shipping from the English cruisers. (This is no secret; all the world knows it, and wonders at the apathy of our people on the subject of national defense.) No business men would risk for one night all his stock in trade without insurance; on the contrary he insures it for months, and his buildings, years at a time. The former for certain per cent. of its whole

value, and the latter at such a valuation as would enable him to rebuild. One per cent. of the valuation of the destructible property within a radius of seven miles of the New York City Post-office would place that port in a position of defense as to fortifications and guns as to be ensured against any foreign attack for all time, unless the place were lost through treachery or the pusillanimity of its defenders. Ten per cent. of this valuation would place the entire country, including sea-coast and lake ports, in a position of security, and also furnish a Navy to protect our citizens and our flag wherever they may be in the world.

Secondly.—The fisheries compose only a small percentage of the value of the business between the United States and Canada, and it may be possible that our fishermen have been at fault themselves in making demands to which they have no right. The United States is as much bound to prevent her citizens from doing wrong to Canada, and to prevent trespassing on Canadian domain, as she is to prevent crime on the high sea or at home. Examination of the trade between the two countries shows a great dependence of the Pacific Coasts upon British Columbia for coal, and other enormous interests have grown up all along the frontier which are mutual, and which would be sacrificed for the sake of one small section of men, who would not be benefited by retaliatory measures.

Thirdly.—The interest and developments of both sides are most intimately connected, and the most cordial relations should exist between the two countries. These will probably assume such proportions in the near future as to cause either the annexation of Canada to the United States, or the total independence of Canada of British rule; and in that event an offensive and defensive alliance with the United States.

Fourthly.—Annexation to the United States by peaceful means would be of immense advantage to Canada as well as gain to the former. It would result, as a matter of course, in the event of a War with England, who has as much as she can do to take care of coercion in Ireland and the threatening attitude of Russia in the East.

Lastly.—Our country is growing, and is taking the lead among the nations of the world, therefore she has need of all her sons. Each must learn to do his utmost for the State, whether in civil life as a *voter*, a judge, legislator, or in the Government Service, in the Army or Navy; in each the country demands his

best services. Behind each American citizen America stands, and, as it makes him a man, let him realize it fully, and let him not falter or fail in his duty to her.

L'avenir 64.

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Extract from the minutes of a meeting of the Executive Council of the Military Service Institution, held at Governor's Island, N. Y., January 23d, 1888. Gen. H. L. Abbott, U. S. A., in the chair.

* * * * *

The report of the Board of Award on the Prize Essay of 1886 was then read, as follows:

I beg leave, in returning these documents upon the "Defense of the Northern Frontier," to say that, of two anonymous contributions, I *vastly* prefer that one, which in its handwriting is neat, because it is the more *able* and *comprehensive* of the two.† * *

JOHN NEWTON.

* * * * *

I have the honor to report upon the two essays submitted for my opinion "Upon the Defense of Our Northern Frontier." That I regard the one signed "L'Avenir" as the best of the two. Both exhibit considerable research and study. Neither are very complete nor clearly confined to consideration of the subject. The merits and defects of each are nearly equally balanced, and I was long in doubt as to which the highest position should be assigned, but finally decided that the one signed "L'Avenir" was the most critical and compact of the two. * *

I. VOGDES,
Bvt. Brig.-Gen., U. S. A.

* * * * *

I have read with care the essays submitted in competition for the annual prize of the Institution, on the subject of "Our Northern Frontier," and, in my judgment, their order of merit is as follows: First, "L'Avenir." Second, "Gardez Bien." * *

H. B. LEDYARD.

The envelopes containing the names of the competitors were then opened, and it was found that the essay signed "L'Avenir" was written by 1st Lieut. THOS. M. WOODRUFF, 5th Infantry, who was therefore entitled to the *Gold Medal* of the Institution.

The essay signed "Gardez Bien" was found to be written by 1st Lieut. A. D. SCKENCK, 2d Artillery, and, under the rules, is entitled to *Honorable Mention*.

† MS. signed "Gardez Bien."

HOW TO FEED THE SOLDIER.*

By BREVET.-MAJOR WILLIAM F. SPURGIN, U. S. A.

Captain Twenty-first Infantry.

THIS paper which I shall read, and which bears date July 25th, 1885, is, with some few additions, the same as when first written and is entitled:

"Proposition: *To Change the System of Subsisting Enlisted Men in Garrison.*"

In considering this proposition it will be well, first, to examine the present system of supplying enlisted men their food prepared and served in company messes, noting objectionable features connected therewith, before proceeding to the consideration of the proposed plan, which is that of subsisting them by means of garrison messes.

At present, each company commander, whether the captain, a lieutenant of the company in the absence of the captain, or an officer temporarily in command in the absence of all company officers, draws from the U. S. Subsistence Department, on approved requisition, all rations for the company, excepting the flour ration, and causes them to be cooked and served by men of the company, selecting as cooks the most suitable privates.

The work of the mess is usually performed by one non-commissioned officer in charge, two (2) cooks, who serve without extra compensation, other than such as their comrades in the company may voluntarily pay them, and one or more men detailed daily to assist the cooks, and denominated "kitchen police."

The food is served on plain deal tables, the men sitting on benches and eating from tin plates and tin cups, or from ironstone ware according to the state of the company's finances, the

* Read before the Institution, Oct. 14, 1886.

company mess kit, other than the articles furnished by the Ordnance Department, being purchased from the company fund. The rations, owing to the excellent administration of the U. S. Subsistence Department, are invariably good. Sometimes they are excellently, and again, inferiorly cooked and served; the degree of excellence depending upon the ability and carefulness of the cooks for the time being. The flour ration is turned over to the post bakery, the company receiving in lieu thereof a ration of bread for each ration of flour, whilst the profit accruing to the bakery in transforming the flour into bread, and estimated usually at 33⅓ per cent., goes not to the Company Fund, but to the Post and Regimental Funds—fifty per cent. to each, a loss to the company of one-third of the value of the flour ration, but a loss under the present system necessary to the end that companies may be supplied with wholesome bread.

The company commander, when the company is favorably located, secures for the company a garden and endeavors to cultivate such products as can be raised in the latitude where stationed, employing constantly during the season one or more men as gardeners, and at harvest-time, especially that of the potato, employing all available men of the company in gathering and storing for winter use the products of the season.

The company commander also has charge of the company Fund, which is derived ordinarily from the sale of surplus vegetables and portions of the issued ration.

The ration of the soldier is the sole emolument guaranteed to him by the Government, in the contract which he enters into at the time of enlistment, which is in any way controlled by the company commander, and upon his success in manipulating the same, and in supplying his company with a sufficiency of well-cooked, wholesome food, depends the contentedness, and therefore, largely, the discipline and efficiency of his company.

When a company commanded by an experienced officer remains a long time at one post, and possesses a good garden, or a healthy company fund, or both, its well subsistence is assured unless an effort be made to hoard a large company fund. In such a case the company may be pinched on articles of the rations which find the most ready and profitable sale, that the same may be sold. The bacon and coffee rations are generally the most marketable and are those usually sold. The sale of any portion of the coffee ration subjects the soldier to the loss of a wholesome

stimulant, which he replaces with one of a stronger nature, to his own detriment and that of the Service.

Here may be noted an abuse, *viz:*—the enlargement of the company fund by selling portions of the issued ration belonging to the company as constituted in personel to-day, for the purpose of anticipating the wants of the company when the personel may be partially, or may be wholly different.

When a company is without a garden, or with a poor one, and has a meagre company fund—which is usually the case when there is no garden— the matter of properly subsisting it is, to an efficient company commander, a most difficult one, but when it is commanded by an officer lacking experience, in addition to being destitute of competent cooks, garden, and company fund, its condition is lamentable.

That a company may be thus unfortunately situated is alone a sufficient reason for condemning the present system of subsisting enlisted men.

Experience shows that all companies serving at the same posts are not equally well-fed, and that on account thereof, dissatisfaction exists to a greater or less degree in the poorer-fed companies.

The cause of such a state of affairs may reasonably be found in the fact that all companies are not on the same footing as to cooks, gardens and company funds. Sometimes the men of poorer-fed companies lay the blame, justly or unjustly, at the doors of their company officers, odiously comparing them with the officers of well-fed companies. Such comparison causes a loss of respect for their officers; heartfelt insubordination, a settled conviction that they do not receive all that the Government intends they shall have, and a feeing of irremediable and unjust treatment which prepares the mind for, and suggests desertion.

The difference in the subsistence of companies serving at the same garrison, whether in respect to quantity or quality of food, furnishes, in my opinion, the gravest objection to the present system of subsisting enlisted men.

At present, companies are frequently required, by the exigency of the Service, to suddenly change station, or take the field for a protracted period. In such cases their gardens are either abandoned or sold at a sacrifice; in either case entailing a loss to the company not fully comprehended until after joining the new station it finds itself unsupplied with vegetables; and if destitute of a fund, entirely dependent upon the issued ration, and this,

too, whilst the other companies at the same post, more fortunate, are well supplied with vegetables.

The system proposed for subsisting men in garrison provides for one garrison mess at each post, which, in lieu of the company messes, will supply all enlisted men at the post with the same food at the same time.

In the establishment of such a mess, which I would denominate U. S. Garrison Mess, Post of ———, the following requirements are essential:

A sufficiently commodious mess-room, furnished with tables and benches, or Army chairs, ample for the accommodation, at one sitting, of all enlisted men of the garrison; with kitchen of sufficient capacity, detached, but connected with the mess-room by an enclosed, ventilated passage-way, that the odors of preparing food may not permeate the mess-room, and furnished with range, cooking utensils, dish-pantry, sinks, refrigerating rooms, or cellars, and such other conveniences as may be obtainable.

The Quartermaster's Department, under the head of Camp and Garrison Equipage, should supply (as it now supplies mess-pans, camp-kettles, ranges, etc., etc.) all tableware required for the mess, issuing the same on approved requisition to the officer in charge of the mess to be accounted for and disposed of as other Government property.

The basis of the requisition should be, for each soldier: one (1) quart bowl, one (1) dinner plate, one (1) tablespoon, one (1) teaspoon, one (1) knife, one (1) fork, and one (1) tumbler; and for every ten men one (1) meat-platter, two (2) vegetable dishes, one (1) each: water-pitcher, salt-cellar, pepper-box, carving-knife, fork and steel, soup-tureen or large bowl, syrup-pitcher and two tablespoons. The knives, forks and spoons should be of a quality superior to such as are now furnished for field service, whilst the dishes should be of the heaviest American hotel china, *firsts*, the same being more desirable every way than ironstone ware, and costing about the same as the best quality of the latter.

To each U. S. Garrison Mess there should be one selected chief cook, denominated "Chef," who should serve as such for a period of not less than six (6) months, receiving for his services the highest grade of extra duty pay. There should be one assistant cook for every 100 men, or fraction thereof, and the number of said assistants, whatever the number of men in the mess, should never exceed three, since one chef and three assistants

would be enabled to cook as easily for 500 or 600 men as for 300 men.

The detail for assistant cooks should be equalized amongst the companies, and each should serve for a period of three months. They should be classified and relieved every ninety, forty-five or thirty days, accordingly as there are one, two, or three assistants. The assistant cooks should receive laborers' extra duty pay, and, with the chef, should be excused from all military duty proper, attending muster only, and then equipped as the company.

There should be for every sixty (60) men, or fraction thereof, one "kitchen police," who should assist the cooks in preparing vegetables, cutting wood, setting tables, washing dishes, and in any other work about the mess. They should be detailed equally from the companies; if practicable serving for ten days, and one-half the number being relieved every five days.

An experienced officer should have charge of the mess, giving it in all details the closest personal attention. He should be the most efficient officer for the purpose at the post, whether field officer, captain, or subaltern. Such officer, always under the orders of the commanding officer, and assisted by a selected non-commissioned officer, should have sole charge of the mess and attaches, and should sign all requisitions for rations and camp and garrison equipage required in the mess, from data furnished at the adjutant's office. He should have charge of tillable land amply sufficient for the production of all vegetables required by the mess, and with as many gardeners as, in the opinion of the commanding officer, may be necessary. He should cultivate such land as a permanent garden, planting asparagus beds, small fruits, etc., in addition to vegetables, housing and caring for winter supplies, and disposing of surplus products, if any, for the benefit of the mess. He should have control of the post bakery, that he might, when desirable, increase, diminish, or vary the bread ration; and all net savings of the bakery should accrue to the mess fund. He should cause the entire coffee ration to be regularly served, that the soldier may have a daily strengthening stimulant, and should never dispose of the other portions of the Army rations excepting when, from an abundance of vegetables, the same may not be required and therefore rendered surplus. He should secure to the mess, three times daily, an abundance of good, wholesome, well-cooked and properly-served food. Then, and not till then,

should he dispose of rations or attempt to establish a mess fund. He should keep a mess fund account, similar to the post fund account, which should set forth all receipts from whatever source, all expenditures and quantities and articles remaining on hand. This account should be rendered at each muster and, after having been subjected to the administrative scrutiny of the Post Council of Administration, should be transmitted, through the proper channels, to the Adjutant-General of the Army.

When there is a mess fund an effort should be made to procure cows, pigs and chickens, as permanent property, since their productions will materially assist in the domestic economy of the mess, whilst their maintenance can be accomplised by grazing and consumption of refuse from garden and mess kitchen.

The officer in charge, appreciating the responsibility resting upon him, and earnestly and intelligently performing his duties, will be successful; and besides the consciousness of having performed his duty, will be aware of the kindliest feelings being entertained for him by those whose interest he serves.

Under the proposed system, when a company forming part of the garrison is ordered elsewhere, the Post Council should be convened, and should make a pro-rata allotment of such portion of the mess fund as may have accrued whilst the departing company formed a part of the garrison, and which at the time may be unexpended. Such allotment should be transferred by the officer in charge of the mess to the same officer at the new station; and the company on arrival thereat, whatever the allotment, would immediately join the garrison mess, and be on the same footing as other companies there serving.

From data at hand, believed to be reliable, it appears that the four hundred and thirty (430) companies of the line of the Army occupy one hundred and fourteen (114) Army Posts. Under the present system, the messing of these companies requires 430 separate kitchens and dining-rooms, cooking and mess outfits; the administrative supervision of 430 officers, the personal attention of 430 non-commissioned officers, the services as cooks of 860 enlisted men, and the labor of at least 430 men as kitchen police, making a total of 1720 enlisted men, or over 7 per cent. of the total enlisted strength of the line of the Army (Cavalry, Artillery and Infantry), employed in connection with company messes. That this estimate is too small, is patent to every one conversant with the subject, since some companies employ *two* kitchen police.

From the same data, the one hundred and fourteen posts, may be classified, according to the number of companies in garrison at each, as follows, *viz:*

Eighteen	1	Company.
Twenty-seven	2	"
Fourteen	3	"
Eighteen	4	"
Eighteen	5	"
Five	6	"
Two	7	"
Four	8	"
Three	9	"
Four	10	"
One	11	"

Owing to the absence of information relative to the numerical strength of the garrisons of the foregoing posts, I am unable to show the exact number of men required under the proposed plan to conduct the 114 Garrison Messes. If the average of all companies be taken at 54+, a number derived by dividing 23,245, the total strength of the line, by 430, the number of companies therein, or at 55, we can determine, approximately, the number of men required as per the following:

Classified Posts.	Posts of each class.	Men in each Garrison.	Attendants for each United States Army Mess.						Total enlisted required for Messes at each class of Post.
			Officer in Charge.	Non-commissioned Officer in Charge.	"Chef."	Assistant Cook.	Kitchen Police.	Total enlisted required in each Mess.	
Companies.	No.	No.	No.	No.	No.	No.	No.	No.	No.
1.	18	55	1	1	1	1	1	4	72
2.	27	110	1	1	1	2	2	6	162
3.	14	165	1	1	1	2	3	7	98
4.	18	220	1	1	1	3	4	9	162
5.	18	275	1	1	1	3	5	10	180
6.	5	330	1	1	1	3	6	11	55
7.	2	385	1	1	1	3	7	12	24
8.	4	440	1	1	1	3	8	13	52
9.	3	495	1	1	1	3	9	14	42
10.	4	550	1	1	1	3	10	15	60
11.	1	605	1	1	1	3	11	16	16
Total,	114								923

Here we have 923 enlisted men accomplishing, under the proposed system, the messing service of the Army, as against 1720

men under the present system, a saving of the labor of 797 men, or of over 46 per cent. Should we take into consideration the fewer number of gardeners required under the proposed system, it will be found that the saving of labor is over 50 per cent.

In addition to this great economy of labor of men, an item itself of the greatest importance, there will be other savings as follows, *viz:*

In the cost or ranges and fuel, since only 114 cooking-fires will be required instead of 430.

In the cost of transportation, since the company mess kit as now required, will be no longer transported when companies change station.

In food; for whilst the cost of rations will be the same to the Government as now, the benefits which the men will receive from the ration will be greater, the proportional cost of subsistence per man diminishing as the number of men subsisted increases.

In the clerical labor, expense for stationery, etc., connected with the rendition of returns, since the garrison mess fund will supersede both the company and post funds, accomplishing as it will the ends now sought through them, and causing the regimental fund which is based upon them to disappear.

In the labors of company commanders and their first sergeants, who will be relieved in garrison: (1) of the domestic drudgery now imposed upon them; (2) of the clerical labor and oftentimes annoyance connected with the rendition of their company fund accounts, and (3) of possible complaints, just or unfounded, made by men of their companies relative to their food, or to the expenditure of the company fund.

In the saving to the soldier that portion of his flour ration, which, whether it can or cannot be spared, is now divided between the post and regimental funds.

In the number of garbage repositories necessarily connected with each kitchen, and which, reduced to the minimum, can be easily controlled.

In the greatly diminished opportunities for peculation of rations and for waste.

Important as are the foregoing economics, the greatest benefit to the service, and the one which cannot be estimated in dollars, will be the removal of causes producing discontent, and the inauguration of an efficient system which cannot fail to secure to the enlisted men contented minds in well-sustained bodies.

DISCUSSION.

BREVET LIEUT.-COLONEL WOODHULL, MEDICAL DEPT., limiting his remarks to the question of messing, and not discussing the ration as food, was of opinion that for ordinary posts a garrison mess was objectionable, in that it would tend to concentrate the knowledge and the practice of cooking in the hands of a very few, and would leave the soldier comparatively helpless when called into the field. He believed that, other things being equal, the soldier whose wants are at the minimum, and who is the most nearly self-sustaining is the most formidable, and that all unnecessary dependence upon a comrade would be to his disadvantage. The Indian raiders and the Indian scouts of the south-west are types of efficiency in that direction. In absence of a propercommissariat and the importance of the citizen-soldiery in preparing without notice such food as was obtainable, had an important bearing upon the lamentable failure of the Pennsylvania troops in the riots of '77. On the other hand, the complete independence that their own camp-fires afforded, their entire freedom from the trammels of local or special conveniences, the assurance that they could stay indefinitely wherever placed, were of great aid to the Regulars in overawing the strikers of 1877 and the draft rioters of 1863.

He regarded a typical company as one in which no man is necessary and every one is interchangeable. He would have the ordinary cook an instructed soldier on extra duty, who should turn out for company drill, and he would require every private to take his regular tour as kitchen police and afterward as an assistant, but when pronounced qualified to cook the ration well, to be put on a separate roster for kitchen duty only in emergency. A late writer in the JOURNAL* cites the militia camp of instruction at Peekskill as being so supplied with apparatus of convenience that "all the different kinds of dishes usually supplied in restaurants could be called for," and regards the introduction of such arrangements in the permanent posts desirable. Should this convenient array of steam heat and automatic apparatus be engrafted upon the garrisons, should these mechahical appliances and conveniences of modern life be made to surround the soldier, whose whole ordinary existence is a mere education for the field preparatory to campaign and rugged conflict against man and nature, it will convert him into a mere armed dweller in a city, so that, like the ordinary civilian, he will fall a ready victim to his own helplessness when sent a-field. The speaker hoped that the regular forces would not be seduced into any such paths of pleasantness, ways that are literally ways of Peace alone.

He believed that is sufficient for the men to be fed well enough, that like other laborers, soldiers required nutritious food well cooked, rather than to have their tastes and appetites led astray by over-refinement whose ultimate result must be dissatisfaction

* Vol. VI., No. 24, pp. 305-6.

and inefficiency. Doubtless economy in the use of rations increases with numbers; but food is not supplied with the view of eating to replenish the company treasury, and although consolidated messes may save men for the drill-ground, it will only be at the expense of other knowledge that will enable them to keep the field. Should the objection be raised that, after all, there is practically a permanent company cook who monopolizes the information, the reply is, that it is the fault of the company government. But the cook need not be frequently changed, although new assistants should be constant learners.

A very serious consequence of this severance of the company officers from the direct care of their men would be their gradual loss of a sense of responsibility in this important particular. Powerless to correct errors, to make improvements, or even to inspect the tables except in the most indirect and occasional manner, the captain would wash his hands of the whole business or there would be constant friction from his effort to interfere. The company fund would be made and expended by another, and, whether well or ill-fed in garrison, the men would go into the field unprepared themselves, and with their officers unaccustomed to instruct or to direct them.

While the foregoing is true of all ordinary posts, the recruiting depots are exceptions, to which garrison messes are peculiarly adapted. At the depots the men are taught the military rudiments, and the companies exist only for tactical instruction. It is useless to try to cram into the recruits a knowledge of cookery along with their technical information, and to save men for drill and rations for the table is the peculiar need of these preparatory schools.

CAPTAIN JAMES CHESTER, 3D ARTILLERY.—The subject of "Army Messing" is one that will interest every Company Commander. I assume that the field ration will be reformed. That the Army should continue the unscientific ration and methods of cooking of fifty years ago, when commercial enterprise has made such advances in the condensation and preparation of food, is hardly to be expected. There must be a change. The medical statistics of armies clearly show that in active campaigns more men succumb to disease than to the casualities of battle, and that the most prolific fountains of disease are defective camp sanitation and bad cooking. With the former we have nothing to do at present. As to the latter, I claim that it is inherent in our system.

During an active campaign when the men most need nutritious, wholesome food, our system condems them to the sorriest and scantiest diet. The company wagon, always overloaded, and alway behind comes lumbering along with the division trains, and arrives in camp—if it arrives at all—many hours after the company. The men hungry and discontented; the cooks tired and ill-natured; the cooking hasty and horrible. If fresh beef has been issued it has been newly slaughtered, and often goes into the kettles before it is cold. The greasy liquid in which it has been boiled, with a handful of half-cooked rice in it—there are rarely any vegetables—is called soup, and is eagerly devoured by the hungry men. Next morning there will be large additions to the sick-list. This picture will be familiar to old campaigners. They may remember having fought against its evil features and suffered defeat. The system was against them.

I have referred to campaign cooking because it is always advanced as an argument againt the abolition of company cooking. It is assumed that cooking is an essential part of every soldiers' training, and that it would be madness to abolish the only school in which it can be taught. But I would abolish both campaign and company cooking. The latter is wasteful and expensive, and gives unsatisfactory results. The former is unnecessary, and in view of the means now available for

procuring well-cooked, wholesome, and nutritious food for soldiers in the field, I may add, criminal.

In time of War the ration should be issued cooked. This would be a great economy. It would greatly diminish the impediments of an army; it would facilitate the handling and issuing of rations; it would enable the soldier to prepare an excellent meal in fifteen minutes; and it would greatly lessen the sick-list. Nor would it be difficult to carry out. Set up immense Army kitchens at convenient points. Have them under proper military management and medical inspection. Hire competent cooks. Then have good healthy meat and vegetables in proper proportions, cooked, seasoned, and canned. Have one of these kitchens at Boston devoted exclusively to baked beans. Let the cans be of convenient size for messes, and issuing rations in the field would be as easy as dealing a deck of cards. The hard bread also should be put up in packages of ten pounds each, five of such packages to the box, and the coffee and sugar in a similar way—that is to suit messes.

The messes should be uniform throughout the Army—say ten men. They should consist of one sergeant, one corporal, and eight privates. If there are not non-commissioned officers enough to go round, men may be lanced for the purpose. There should never be but one broken mess in the company, and that should be presided over by the first sergeant. It should consist of the tradesmen and company clerk, and such other men as are on daily duty in camp. The other messes should always be kept full.

With such a ration and such a system, campaign cooking would be reduced to its lowest terms. It would consist simply in heating up the meat ration—which could be done in the can—and cooking coffee. The coffee and sugar ration being done up in packages of ten rations each, would be issued to messes, and there the coffee would be cooked. For this purpose each mess must carry a coffee-kettle; and this brings up the subject of carrying the mess utensils.

The spoon, fork and knife, tin plate and tin cup are already carried by every soldier. The haversack, which should contain two days' rations of bread, is also carried by every man of the mess. The coffee-kettle is the only other vessel required. It should be an oval-shaped kettle, eighteen inches deep, with a close-fitting lid and no spout. It should be of tin, and strong enough to stand the hard knocks of service. It is carried by number 1, of the mess, strapped to his knapsack, the straps passing over the kettle near the ends. The kettle lies with its flat side toward the knapsack, and its top and bottom toward the sides. Numbers 2, 3, 4 and 5 each carry a five-pound can of meat, making twenty pounds in all—two days' rations for the mess. These cans should be made long enough to lie on the top of the knapsack, and be held in position by the two knapsack straps. Number 6 carries the coffee and sugar ration under the flap of his knapsack, and a camp-hatchet strapped on top. Number 7 carries an axe, strapped on the top of his knapsack, the edge of the axe covered by a leather pocket strapped on. Number 8 carries a short-handled spade. In this way every mess would be a little army in itself, organized and equipped for any kind of work.

On arriving in camp, or even on halting for half-an-hour, such a mess would light its own little fire, heat up a five-pound can of meat, cook its coffee, and in fifteen minutes sit down to a comfortable and wholesome meal.

Campaign cooking being thus simplified, company cooking, as a school of the art, is no longer necessary, and men in garrison should be fed on sound, economical principles. These will be found to lie in the establishment of one garrison mess. Such a mess, under efficient management, would enable the soldiers to live much better than they do and would be a great saving to the Government. Fewer mess-rooms would be required; fewer kitchens; fewer cooking-stoves; less fuel; less furniture; and,

infinitely, better results. I agree entirely with Lieutenants Hardin and Reilly. But I would maintain the mess organization even in garrison. Tables should be seated for ten men only—that is for one mess. These tables should be arranged "*in column*," so to speak, so that a company at dinner would sit in column of messes, as it were. No matter how many companies or regiments there were at the post, every man and non-commissioned officer would have and know his place in the dining-hall with as much exactness as if he were on parade.

To sum up, then, I say: Improve the field ration as above suggested; organize messes; abolish company cooking; establish army kitchens in War and garrison kitchens in Peace, and have one mess only for every military post.

BREVET-MAJOR JOSEPH G. CAMPBELL, 4TH ARTILLERY.—I am very glad the Institution has taken up so practical a subject as "Army Messing." Nothing is more important or desirable in its results upon every quality that goes toward making an army an efficient machine of force. Without proper food, properly prepared, the best officers are powerless and the most perfect armament is useless. I think statistics will bear me out in the assertion that disease is a more fatal enemy than the opposing armed force, and I believe that improperly prepared food is the foundation as well as the superstructure of the diseases that depopulate armies and sap them of their vim.

The person responsible for the law or rule that company cooks must be changed every ten days should have been made to live at a boarding-house, or in a family where such a state of culinary instability existed. I believe he would either have been kicked out as an unbearable grumbler within the first month, or died on the gallows for murdering his host, or have died of dyspepsia. There would have been about as much sense in saying that, as the captain or lieutenants are liable to be unavailable, from various causes, all the company should know how to do their duties, and therefore should serve in these capacities a regular detail.

I think it as important to have a permanent cook as a permanent captain. There must always be a certain number not present in ranks. The cook should be an educated professional, enlisted for that business alone. I believe they could be more easily obtained and kept in order and discipline if they were negroes, who are natural cooks generally. One to a company would be sufficient. In the field during War the company would, or should, be 100. An assistant or two, detailed to help after the march, would give the additional labor; the men, of course, would keep their own eating-kits clean. In garrison, during Peace or War, I would aggregate instead of segregate the cooking and messing. How long would it take the proprietor of the Fifth Avenue, or any other large hotel, to lose his money and his reputation as well, if he should establish a kitchen and dining-room on each floor and compel the inmates thereof to eat of their local cook's food. How long before each floor would be dissatisfied and imagine the one above or below was better fed. And yet there are more people by far on each floor than in any company, and from the circumstances of the case every facility is better. In a garrison of say five companies, under the present system there are five kitchens, each feeding, say thirty to thirty-five men; each kitchen has two cooks permanently, and all of variable ability, to prepare food; there are five fires to be kept going, any one large enough to cook for the entire number of men in all the companies. There would be five sources of waste; five chances for mistaken judgment as to what and how to cook it, and ten chances to cook too much or too little, and ten chances to overcook, undercook or burn; for the first cook is very apt to trust to his assistant. Instead of five mess rooms one would suffice, and the rooms now so used could be utilized for other living purposes. Then there are five first sergeants to come in and mix things, often to their detriment. There would be five captains to direct; to say what

rations not to draw, and what to buy with the fund. Any, or all, may be attentive, or shiftless, leaving it to the lieutenant or more frequently the sergeant; often never seeing the food, either raw or cooked, or the kitchen even; often not knowing what is bought, or whether above or below the market value price, sometimes anxious to pile up a large fund; sometimes to expend it on Irish damask, monogram linen, silver-plated articles, or painted cups and plates.

Handling large amounts, purchases could be more advantageously made with the savings which would per capita be greater.

An officer should be detailed to run the institution; the captains and the subalterns could inspect the meals and hear the complaints of the men, and the commanding-officer could right them in case of any difference. There is no doubt as to the economy, and I believe there would be much better living, greater variety could be obtained, and fewer persons would be taken from their legitimate duty than now—this is a very important item.

A garden should always be provided for the garrison mess. When there is suitable land on the reservation it should be hired by the Subsistence or the Quartermaster's department. Extra-duty pay should be paid men to work this garden, which should be under control of the officer in charge of the garrison mess.

When fresh potatoes cannot be raised, or when troops are in the field, Kiln-dried or dessicated potatoes should be part of the ration. In fact, the potato should be made a component part of the ration, say one-third pound per day, per man, of fresh potatoes, or its equivalent of dessicated. Ten pounds of rice per 100 rations should be restored, and the soldier should, when furnished with fresh bread have, in kind, or money value, all the flour savings now appropriated to something else. There is nothing more provoking to the soldier than the knowledge that part of the flour, that the laws of his country gives him to eat, he cannot get; that if he wants a little flour to brown his gravy or make an occasional pie-crust or duff, he must pay for it.

That the ration is not large enough is fully shown by the fact that, during the Rebellion, it was increased in flour, rice, beans, potatoes and molasses. Option should be given to draw chocolate or cocoa if preferred to tea or coffee.

In these days of wholesale butchers and Chicago beef a great improvement would be to change the contract for fresh beef in all posts where near large markets, specifying that hind quarter, round, standing ribs and sirloin should be supplied; at posts where the Government kills and issues its own beef, of course all would have to be issued. But at posts within reach of Chicago-killed beef, money would be saved the Government in price by excluding the cuts named, and the soldier would get what he wants: good wholesome, eatable beef, and a minimum of bone.

Meat, as a general rule, is too much cooked in the Army. In a system of post messing this would be more easily avoided by the pieces being so much larger. It is very difficult to roast or broil a small piece of beef to the exact degree.

The Warren Cooker, or Arnold's Automatic Steam Cooker, is a great help in regulating our cooking of meat, and should be supplied by the Quartermaster's Department as stove or range furniture. Coffee-pots in which coffee is made without boiling should also be supplied. "The Champion" coffee-pot or any form that makes coffee by pouring boiling water over finely ground coffee, and a first-class steelcoffee-mill, should also be issued by the Quartermaster's Department to each company as stove furniture. A large part of the stimulating and nourishing properties of the coffee fed to the Army is boiled off in vapor while the bittter stuff is being made.

Some years ago, with a company of thirty men, I tried the experiment of weighing all the food raw, and weighing it after cooking, and then all that was not consumed, or the waste, for several weeks. The result was as follows: In fresh beef, the contractor,

a large dealer in the principal market of San Francisco, Cal., consented to give me "rump and round" exclusively during the month. Hence the small amount of bone.

FRESH BEEF.

Raw.	*Roasted.*	*Bone.*
799 lbs., 9 oz.	638 lbs., 12 oz.	45 lbs., 7 oz.
	Total eaten, 74.18 pr. ct.	Bone, 5.68 pr. ct.
Raw.	*Boiled.*	*Bone.*
339 lbs., 1 oz.	268 lbs., 4 oz.	19 lbs., 10 oz.
	Total eaten, 73.34 pr. ct.	Bone, 5.78 pr. ct.
Raw.	*Fried or Broiled.*	*Bone.*
213 lbs., 5 oz.	168 lbs., 9 oz.	7 lbs., 1 oz.
	Total eaten, 75.7 pr. ct.	Bone, 3.56 pr. ct.

CORNED BEEF.

Raw.	*Boiled.*	*Bone.*
53 lbs.. 12 oz.	43 lbs., 15 oz.	3 lbs, 14 oz.
	Total eaten, 75.53 pr. ct.	Bone, 5.5 pr. ct.

IRISH POTATOES.

Raw.	*Roasted.*	*Waste.*
177 lbs.	151 lbs., 12 oz.	33 lbs., 4 oz.
		Total eaten, 118.5—67 pr. ct.
Raw.	*Boiled and Mashed.*	*Waste.*
135 lbs.	103 lbs., 12 oz.	20 lbs., 11 oz.
		Total eaten, 73 lbs.—54 pr. ct.
Raw.	*Steamed and served in jackets.*	*Waste.*
1,123 lbs.	1,025 lbs., 10 oz.	236 lbs., 2 oz.
		Total eaten, 7,897 lbs.—70.32 pr. ct.

SWEET POTATOES

Raw.	*Steamed and served in jackets.*	*Waste.*
488 lbs., 12 oz.	449 lbs., 15 oz.	105 lbs., 2 oz.
		Total eaten, 344.8 lbs.—70.55 pr. ct.
Raw.	*Baked in jackets.*	*Waste.*
177 lbs.	158 lbs., 1 oz.	38 lbs., 13 oz.
		Total eaten, 119.25 lbs.—67.15 pr. ct.

APPLES.

Raw.	*Pared and steamed.*	
73 lbs., 5 oz.	52 lbs.	—70.7 pr. ct.

The cooking business and the ration should be agitated till a reform is achieved. The bake-house should belong to the post mess; all could be run successfully together, greatly to the advantage of the soldier's comfort, health and happiness. In case a company was detached its cook would go, and he with the assistance of a man would do much better than the present arrangement is capable of.

I would like to see this community-cooking tried by mutual agreement at some place, with an officer in charge of it sufficiently interested in his profession and possessed of sufficient industry and energy to do something more than draw his pay and growl at every duty imposed. Even without the bakery and garden, I believe it would show for itself.

COL. R. F. O'BEIRNE, 15TH INFANTRY.—The subject which has occupied the attention of the Institution to-day is a most interesting one, and has been presented in so thorough a manner by the excellent papers, which have been read, and also by the discussion of them, that it appears to me there is little left to be added.

In this age of improvement I can see no good reason why the soldier should not be benefited by any reform which will insure a better condition of things in the preparation of his food—and which, I think, has been successfully shown in the discussion of the subject to-day.

It is probably known to you, sir, that the new method of cooking food is about to be adopted at David's Island. The Mess-Hall is nearly completed, the kitchen utensils will be in readiness in a few weeks, and there is good reason to believe the enterprise has every prospect of success.

I will add a cordial invitation to the members of this Institution to make the Island a visit, with the view of seeing the new plan in practical operation.

CAPT. H. F. BREWERTON, 5TH ARTILLERY.—The object to be attained would seem to be a method providing not only for the feeding of men in garrison, but also in the field.

Under the present system a company is detached for Service, and no difficulty, apparently, is encountered in its messing; because the non-commissioned officers and others have had constant experience in its kitchen, and consequently possess practical knowledge of the ration provided and how to utilize it. So accustomed are they to looking out for themselves in this regard, that rations and mess-furniture are quickly packed upon the receipt of an order to move, and whether the destination of the company be field or garrison, upon its arrival the company mess is at once quietly started.

It may be considered doubtful whether such could be the case if all the companies at a post were messed together. Then, instead of those familiar with the ration and its preparation (of which every soldier of any length of Service now knows something), you would soon have a lot of men eating their meals as people do at any hotel or restaurant, but who, when called upon to take the field, would presumably be unable to care for themselves so far as messing was concerned.

The permanent cooks of the "Post Mess" might naturally become (in their own estimation, at least,) of great importance, and it would, perhaps, be discovered that in large garrisons the number of soldiers considered necessary to assist these "*Chefs*" would not fall far short of the maximum "Kitchen Police," as at present organized—*i. e.*, one to each company.

The officer assigned to the duty of conducting such an establishment might possibly find his hands more than full, unless he happened to be a born "Boniface."

Our Army is a small one, and a company is liable at any time to be ordered on duty which involves separation from its station. Then it needs its own outfit for messing in good running order.

In this country soldiers are not billetted on the people, as is done elsewhere.

Company commanders, who have seen Service in the field during War, will doubtless remember the trials and tribulations of troops, who, not having been accustomed to draw and cook rations, were suddenly thrown upon their own resources—as in strong contrast to those enjoying the advantages of a permanent company mess.

A company with its own mess is believed to be more independent, whether in garrison or field, and if long established, should be able to live comfortably and well.

At General Recruiting Dépôts a post mess, provided with all the modern conveniences, may work admirably.

BVT.-COL. A. L. HOUGH, LIEUT.-COL. 16TH INFANTRY.—I am afraid the Army will run the messing business as a hobby, as it did signaling some years ago, and target-practice, until recently. We are apt to *over-reform* when we reform. I made great exertions to have a garrison mess established at this dépôt,* and have succeeded: a Mess Hall to seat 500 men, and cooking arrangements for 1000 men is now under contract, and before my tour here ends, I hope to see it in full operation. While I am so warmly in favor of having a general mess for the four or five hundred raw recruits passing through here, who are here only a short time, and while here are wholly occupied in receiving military instruction, I am firmly opposed to abandoning the company mess for the Army as a whole. The self-reliant, the self-sustaining character of the American soldier is largely dependent upon his ability to "rustle," to use a frontier phrase, and if the men should be boarded at a post mess, the company mess kit would contain awkward tools for a company in the field or on detached service. I think the post mess system might possibly be extended to the large posts which are of the nature of reserve posts or dépôts, but no further. Our soldiers are children enough as it is in the way of dependence upon their superiors for all wants, and if we now prepare his food for him, we will have a sorry, suffering lot of babes when they are placed where they cannot get well prepared and cooked food. The more this view of the question is investigated, the more I believe it will be found that to so supply the soldier food as to not give *every* soldier the necessity of preparing it to be eaten, will be wrong.

CAPTAIN GEO. H. COOK, ASSISTANT-QUARTERMASTER, U. S. A.—It has been made my duty to give effect to the intention of the War Department to practically test the value of a consolidated mess for enlisted men, and a large establishment is being constructed under my direction and supervision at the Principal Depot of the General Recruiting Service, at David's Island, N. Y. Harbor, which will be provided with the most approved apparatus for steam cooking. The buildings are of brick, large and substantial, will be heated by steam and lighted by gas, and have other improvements not generally seen in the Service.

I am trying to make it as perfect as possible, within reasonable limits, and have investigated the progress made by some of our best public institutions where the conditions are somewhat similar to military messing, such as the Soldiers' Home and the Sailors' Snug Harbor, on Staten Island. The latter is a model place, where I learned many useful things. I quickly saw that such inspection was useful, chiefly in showing the economy and practicability of cooking by steam on a large scale, and that in some respects they could not serve as models for the active Army. At the Homes the more men employed the better, but with us we require as few in the messing department and as many in ranks as possible. I have endeavored to meet this difference by supplying labor-saving devices, and to do away with the large force ordinarily needed in a dining-room 150 feet by 53 feet. A railway and table cars will be provided that a few men may promptly distribute dishes and food. Knowing that there would be some opposition to the idea of a consolidated mess, I have tried to look at it from the standpoint of the company commander, and to meet and overcome the honest and apparently reasonable objections he might have. He would naturally object to turning over a portion of his command to the manager of the mess hall for work there if old-fashioned arrangements prevailed, and he might regard the loss of control over so important a matter as the company mess as an injury to the Service. The force now required for messing can be largely reduced by the new system, and I believe it is not intended to deprive the company commanders of a reasonable supervision, but that they will constitute a board, or council, under the Post Com-

* Davids Island, N. Y. H.

mander. The manager would practically be their agent for administering the affairs of the mess.

One of the serious labors of the company mess in many places is the scrubbing of the soft wood tables, a labor so great, if applied to the demands of a mess hall for 600 men, as to stamp the affair as a failure in the estimation of the officers who supplied the necessary force. Large hard-wood tables would not only be expensive but their use would interfere with the employment of the large dining-room for evening amusements. I have caused a table to be made which admits of prompt removal and small storage space, and has the advantage of being cheap, easily cleaned and non-absorbent.

It is composed of two parallel boards of clear white pine, each sixteen feet long, eighteen inches wide, and two inches thick, not fastened together, but lying side by side on two light wooden trestles. These boards are treated with wood-filler, and then covered with three coats of best "spar composition," such as one sees on the fine yachts in the harbor. Water has no effect, a warm plate does not discolor it, and the ordinary wear and tear of Service leaves so little impression that the trial-table made last April cannot be distinguished from the new ones beside it in the depot detachment mess room. The rich golden color showing the natural grain of the wood adds to the cheerfulness of the general effect. I mention this table in detail, as it may be of interest to company commanders.

From my observation and close attention to the subject for some time I am satisfied that the consolidated mess system is the true one, and that it will be so considered by officers when the means are provided to carry it out in a proper manner. I believe it will not only materially enhance the comfort of the men, but it will leave the company officers free to devote more attention to drill and discipline, and leisure to devise ways and means for caring for the men in the field that will produce results superior to anything we can now claim.

When we look at this question from its practical side, some things which are not clear to those who change slowly and cautiously will be explained. It is not intended to give soldiers "restaurant fare." To do so, from our low-priced ration, would indeed be success. It is simply proposed to give the soldier his meagre fare cooked in the best manner, so that he may know what good food is, and have some idea of what it looks like when properly prepared.

Instead of over-done meat, cooked the day before and served with the indescribable gravy one sometimes sees, we hope to give it to the men directly from the steam-ovens, nicely browned and its nutricious juices preserved. In my opinion, a man living at Delmonico's, if thrown upon his own resources, would get up a better dinner than one accustomed only to the fare of a fourth-rate hotel. The former would at least have a standard of excellence. If we improve the fare in garrison, we may expect better cooking and greater variety in the field. Some officers fear that companies might be left without cooks by the consolidated system. I see no reason for it, as it will be practicable to have a skilled cook wherever there is a large garrison mess, and the improved cooking apparatus will afford so much leisure for the cooks, and so many facilities for learning, that a regular succession of assistants can be arranged so that when a company goes to the field its contingent of cooks will go with it.

It makes little difference in the preparation of food whether the heat is obtained from steam apparatus or an Army range. Experience with the former is easily applicable to the latter, and will prove serviceable with the most meagre utensils. It seems to be the opinion of some officers that if the men are fed from a post kitchen that a fair knowledge of cookery will be lost to the Service. There is but little relation between the present company system in garrison and cooking in the field, as in one case we use

a large iron range and in the other camp-kettles and mess-pans. I will give a practical illustration of the kind of cooks we may expect under the new system: The best cook at David's Island (the first sergeant says he can get more out of the Army ration than any man he ever saw) learned his trade from a confectioner, and was employed a long time in a steam-kitchen. One can hardly imagine a training more foreign to that of the ordinary cook. Reference has been made to the 7th, N. Y., its fine appearance and supposed practical inferiority due to lack of experience in field cooking and kindred duties. I fancy most of us would be glad to have our troops rival that regiment in drill and bearing; and it is possible that if our soldiers had more time for purely military duties, and a better system of messing, they might do so. I imagine that so intelligent a body of men as the 7th, if habitually quartered in their Armory and fed similarly to our proposed system, would have the enterprise and ability to provide for the contingency of field service; and there is no reason to believe that the officers and men of our Regular Army would not be equally active in the same direction. If we find by experience that the men are better fed at less cost by the consolidated mess, we can safely trust to the inventive genious of our officers to find a way to feed the men relatively as well in the field.

It is conceded by all that we should provide our men with suitable barracks properly warmed and ventilated. Is it not equally our duty to see that their food is prepared and served in the best and most economical way our circumstances permit?

The theory that enlisted men should always be surrounded by field conditions would consign them to a life in tents and render the Service intolerable to officers and men. I do not believe in preparing for War by neglecting the welfare of the soldier in time of Peace.

LIEUT. G. N. WHISTLER, 5TH ARTILLERY.—It was my intention, if opportunity offered to-day, to present a few thoughts upon the use of cooked food in the field. Captain Chester, however, has so clearly set forth the subject in his paper, that I could add nothing to it by remark.

I would therefore call your attention to another question in connection with this subject, which I consider of importance and which has not been spoken of this afternoon.

That is the variable value of the Army ration. The ration, as now furnished to the Army, as I understand it, merely represents the amount of food required by the men, and furnished by the Government; in quantity it is ample, in quality it is all that could be asked for, but in variety it is sadly wanting.

To meet this difficulty the Government buys back that which is not needed, and permits the Company Commander to utilize the money thus obtained to give the men a variety of food, and to purchase such articles as are particularly suited to the climate and season; this in theory is well, but in practice it is nullified by the method of repurchase (or making savings, as it is called), due to the variable value of the ration.

Looking over some old Subsistent papers I found the value of the ration some fifteen or sixteen years ago to be about twenty-two cents (you remember how the value of the ration was formerly entered in the commissary papers); to-day it is in this Harbor 11 7-10 cents. At that time, assuming that a captain could make a saving of ten per cent. with a company of fifty men, there might be saved $30 per month, whereas, at present, he could save but $17.50. The ration then was the same as now, the men used the same proportion thereof; but at that time the captain could purchase $30 worth of food per month to give some variety to the meals, whereas to-day, he can purchase but $17.50 worth.

COLONEL HAMILTON. Please note the difference, in purchasing-power, of the dollar at the two dates.

LIEUT. WHISTLER. That is another point to be considered. I maintain that the ration is ample so far as the quantity of sustenance contained therein, but the present value of the articles composing the ration is so little that the amount received as savings is not sufficient to give the men a proper variety, whatever it may have been in the past.

I maintain that the Government should fix the value of the Peace ration at, say fifteen or twenty cents per day. That the captain should be permitted to draw from the Subsistence Department such articles as he may need up to the entire value of the company rations, if he does not need the entire amount in kind, the balance to be paid to him in money.

This would give a constant rate of savings by means of which a proper variety of food could be given to the meu.

In reference to the main subject of discussion, I am in favor of the Post Mess system. Such a system is in practical use in the English Service, and there is no reason why it could not be made to work well in our own. I am of the opinion that the better you feed men, the more familiar they become with well-cooked food, the better they will be able to prepare it when cast upon their own resources.

The gentlemen who now listen to me are not in the habit of preparing their own food; nevertheless many of us have cooked our own meals when on hunting trips; and I doubt not that if put upon our own resources, would do better cooking than the average company cook, who is not so familiar with the taste of well-cooked food.

This, in my opinion, need not in any way affect the question of field rations. With modern appliances, there is no reason why field rations should not be furnished in such a manner as to reduce the necessary cooking to the minimum.

In conclusion I would say that I heartily agree with Captain Chester as to field rations, and am of the opinion that the English Mess system would work a great improvement in army cooking.

LIEUT. H. C. CARBAUGH, 5TH ART.—Our Army ration is intended to be sufficient, both in kind and quality, and by its alternatives is expected to give the variety necessary for garrison or field service, as well as the compactness required by the latter duty. When it is remembered that disease is the great cause of loss to an Army, either in field or garrison, the importance of proper food cannot be overestimated, and its nutritive value must be primarily considered.

In addition to good air and water four groups of substances are essential for nutrition—albuminates to repair muscles and tissues, fats and carbohydrates for heat and energy, and salts for bones and digestive purposes. The amount and proportion of these substances contained by any article gives its value for food expressed in water free or anhydrous terms.

Nutrition then requires not only a sufficient amount of food, but requires these substances to be supplied in the proportion which will insure their use by the digestive system in its work of repair. The amount per day required by each of the three periods, easy, active and laborious work averaged, gives, according to Parkes, 27.125 ozs., water free food, exclusive of salts, while Playfair designates 27.63 ozs., Letheby 30.92. Molleschott, however, places the amount, as determined by experiment, at 22.857 ozs., inclusive of salts for the daily allowance of an ordinary workingman.

It would not seem unfair to advocate that the chemical value of the ration should be at least equal to the average of the amounts given by the eminent chemists, and writer as quoted above. This would require 27.13 ozs. water-free food, and in order that this amount may be properly used, the proportion of nitrogen and carbon con-

tained should be about as 1.n to 16.c. The carbon decreasing with increased activity. If either of these elements is in excess of that required by the particular work in hand, or by the climate, conditions of heat and cold, there will be a direct loss of the excess, as it can not be made use of in the process of nutrition.

In computing the chemical value of the prescribed ration it must be remembered that, practically, it is not the uniform ration of the day, as the system of alternatives gives to "company commanders" considerable latitude in which to vary the constituents and amount of the ration.

Assuming that in "Garrison" life equal amounts of bacon and pork, also equal amounts of beans and rice are issued as prescribed. The ration is given by the following table:

	Albuminates.	Fats.	Carbohydrates	Salts.	Extracts.
20 oz. Beef less ⅛ for bone....					
i. e. 16 oz. ½ of.....	1.2	.675		.1275	
12 oz. Pork of.....	.525	4.395		.18	
18 oz. Salt Bread	1.44	.27	8.853	.237	
2.4 oz. Beans ½ of.....	.27	.025	.60	.03	
1.6 oz. Rice ½ of.....	.04	.005	.666	.004	
2.4 oz. Sugar.....			2.32	.011	
.64 oz. Salt.....				.64	
1.6 oz. Coffee.....					.26

Total water-free value 22.7735 ozs., exclusive of salts and extracts, 21.384. This we see is 5.75 oz. less than our assumed standard, hence, from a chemical standpoint, our ration is much too small.

The issue as above described gives a fair proportion of carbon and nitrogen for a a moderate climate and ordinary routine work. If the issue be all bacon and hard bread the amount of water free food will then be (exclusive of salts) about 28.42 ozs., but this gives too little nitrogenous and too much carbonaceous food for economic use, deducting the water in carbonaceous matter, the total water-free value will be about as above.

As carbon should decrease with increased activity a ration composed of all bacon and hard bread do not constitute a proper issue for field duty, a period of great exertion when the requirements of the body cannot be less than 30 ozs. water free food containing the proper proportion of nitrogenous and carbonaceous matter. These figures, as given above, are however varied, as will appear on examining the practical manipulation of the ration under existing authorities in order to supply deficient vegetable elements, and to create company, post, and regimental funds; and it must also be remembered that the favorable circumstances of garrison life where there is a good gardener, proximity to cheap markets, an economical cook or an expert company commander should not be taken as the basis for issuing the ration, but rather the unfavorable ones of extreme climates, field duty, lack of good cooks, distance from good markets, and no company gardener.

But to return to the ration of the day we find that beef and pork are usually issued in the proportion of 3 to 2, only about one half of the pork allowed is drawn, the balance is taken in money for the company fund. Beans and rice are issued in equal quantities, but very little rice is drawn, as the money value of ten rations of beans (i. e. one and a half pound) is about four cents, and ten rations of rice (i. e. one pound) is worth seven cents, hence money is taken instead of rice, and goes to the company fund to be used in bringing beans in the market. The coffee issued is valued about nine cents a pound. About one-half of it is saved and goes to the company

fund. It is the poorest quality of food issued. One-half of the sugar, value five cents per pound, is used, the balance goes to the company fund. One-half of the soap, at six cents per pound, is very often saved. The company fund is thus raised by sacrificing the ration and by careful management. The amount saved depends more particularly on the former.

Some company commanders pride themselves in its accumulation; others buy mess furniture, beans, potatoes, cabbage, necessary kitchen utensils, also manure and seeds for gardens, 18 ozs. of flour is allowed to be issued. This will make at a low estimate 22 1-2 ozs. of soft bread; the general estimate is 24 ozs. The post bakery, however, only returns 18 ozs. of soft bread for 18 ozs. of flour. The resulting gain is used. First, for the running expenses of the post bakery, of the remainder one-half goes to the post fund, and the other half to the regimental fund. The post fund is further increased by incidental sales around the post, tax on the post trader and sometimes by a little usurious practice, as follows: Flour is not allowed to be issued, but is absolutely necessary for culinary purposes. The companies sometimes save a certain number of 18-oz. rations of fresh bread (which they purchased by turning in 18 ozs. of flour), these 18 ozs. of bread are then traded back for twelve ounces of flour. Sales of bread are made at five cents per 18 ozs. This is legitimate gain and goes to the post fund. The post fund is used to embellish the post, to buy garden seeds and for incidental expenses. The regimental fund is used for paying the regimental band. Thus the soldier's rations is made to cover incidental purposes not provided for by the appropriations.

Theoretically the food its insufficient. It is practically varied so as to supply vegetable matter, and in many posts is increased by produce from gardens, contributions from the men and from hunting and fishing.

At posts where vegetables can not be obtained, the post bakeries are not allowed to make the saving above described, and 22 ozs. of soft bread is given for the 18 ozs. of flour.

Looking at the ration in its practical working, we find that companies do live on it, and that sometimes money is saved. We also find discontent so great as to be an alleged cause of desertion, and that the ration as prescribed is not the ration of the day. The smaller the company, the greater the difficulty in subsistence.* The water free food value of the German Peace ration is 24.80 ozs.; English, 23.19 ozs.; French, 24.14 ozs.; Austrian, 23.3 ozs. Peace; 31.5 ozs. for War; Russian, 34.30 ozs. The German ration on the march consist of 35.2 ozs. bread, 9 ozs. uncooked meat, 4.2 ozs. rice, 5.3 ozs. gruel, 14 ozs. dry vegetables, 7 ozs. potatoes, 9 ozs. salt, 5.3 ozs. of coffee. In quarters 16 centimes is deducted for the general mess. (See Proceedings R. A. Asssociation.)

This does not look as though our troops were the best fed in the world. And it must also be remembered, Americans are not satisfied with what Europeans receive.

In examining the subject we discover the following theories: *First*, that the ration is more than sufficient and that the surplus should be used as a fund for beautifying posts and providing music. This theory needs no comment in view of the facts.

Second, that company commanders should be allowed to take advantage of the locality to increase the variety and if prices admit, the amount of food. To acknowledge this to be true is to admit that the ration is not what it ought to be, and to recommend that company commanders shall use all possible means to pull through, but if they are not successful, then they must use what is insufficient in kind and quality; again as the time when least provision, aside from the issue of the prescribed ration, can be made is the time when the largest amount of food is required, then results hardship and a necessity for making personal comfort and self-preservation the primary duty of our military organization.

*(See Vol. XVIII., 1884, R U. S.)

RESUMÉ.

SYSTEMS OF DEFENSE OF THE PRINCIPAL POWERS OF EUROPE.

By CAPTAIN THOMAS TURTLE, U. S. A.,

Corps of Engineers.

MAJOR HENRY BLASEK, of the Austrian Engineers, published a study in 1881 of the actual condition of fortification in Europe, and several years after he published a continuation of it, setting forth all information of progress subsequently obtained. Both these studies have been reproduced with extensions and additions by Captain J. Bornecque of the French Engineers, well-known as s military writer. The reproduction of the former study was published in 1882, and of the latter in 1885.

Necessarily, the information furnished by these publications is in great part of less immediate interest to us than to officers of European services, and the descriptions quite summary in their nature are lacking in the details of trace, profiles, accessories, and arrangement of parts. Still, it is thought that the following, culled and compiled from them will repay perusal:

Respecting the two grand divisions of sea-coast and inland fortifications, the former is of more immediate concern to us, but the indications in reference thereto are less extensive; the ports defended, or in process of fortification as well as the different works constructed or projected, are enumerated with quite apparent completeness, but details are scanty.

For the protection of harbors, European practice combines forts and batteries, torpedoes, obstructions, sub-marine mines, sub-marine and floating batteries, and all the Powers are, at the

present time, engaged in the strengthening and amelioration of their sea-coast defenses.

In France, the fortifications of Toulon, Marseilles, Brest, Cherbourg, Rochefort, and L'Orient, are recorded as in process of transformation or enlargement, and at the four ports first named, at least, the new work is well formed and in portions complete. Information is given that an allotment of 11,000,000 francs was made for the fortifications of Toulon; 40,500,000 for Brest, and 42,000,000 for Cherbourg. Of these sums large portions are undoubtedly required for the land defense, which in most ports in Europe forms a portion of the system.

The general principles deduced in Italy, as governing the decision as to what ports should be defended and the extent of the defenses, are, that with such great length of sea-coast as that country has relatively, those ports and roadsteads shall be fortified, "which may give to hostile fleets refuge from storms, and provide facilities for the debarcation of troops, but those ports only shall be fortified on the side of the land which contain naval establishments, or which, by their position, may be called on to take an active part in the interior defense of the country. Spezzia, Genoa, Leghorn, Messina, and Venice are the principal points, the greatest expenditure being at the first named port, which with the breakwater amounts to 22,400,000 francs. The estimates for Venice and Messina were 10,000,000 francs each, and lesser sums for other points. It is officially admitted that the armament of the coast is sufficient when it is protected against bombardment from great distances from the shells of heavy calibers, and when the most important points are provided with guns of calibers to pierce the thickest armor at the necessary distances, while other points receive guns at least equal to the greater portion of guns afloat, and which are, at least, ballistically equal to the gun of thirty-two centimetres, the greatest caliber which practically can be turned out in Italy. The fortifications of Messina will consist of armored turrets with guns of the heaviest caliber, and the Strait will be closed by means of torpedoes.

Few data are available for determining the extent of the work of fortification in Russia, but it is certain that a general system is pursued constantly, if slowly. Much work has recently been performed on the Fortresses of Sweaborg, Wyborg, Kronstadt and Dünamünde, and operations had commenced previous to 1881 at the Black Sea ports, Odessa, Otschakow, Nicolaïeff, Cher-

son, Sevastopol and Kertsch, especially Otschakow and Kertsch. From 1857 to 1870 eighteen millions of rubles have been expended in strengthening Kronstadt, and extensive use has been made of armor and revolving turrets, and torpedoes have been added to the defense. The armament is stated as consisting of about 400 guns of the heaviest calibers, and more than 300 of ordinary weight. At Otschakow new batteries with armored turrets, armed with 25-ton and 38-ton guns, are completed. The expenditure here has been five and a half millions of rubles, and this port has become one of the strongest on the Black Sea, though in poor condition for defense during the War of 1877. The following is noted as the general scheme of works in the vicinity of Sebastopol: 1. Sea-coast batteries at the entrance capes of the roadstead; 2. Forts of great area, with sea-coast batteries at the following bays—Cossack's, Kanyzow, Strelezkaïa and Balaklava, to protect the city on the Continental side, and to prevent an enemy from establishing himself firmly in these bays; 3. To cover the large bay by a series of field-works and batteries, and to build forts at the mouth of the Behbeck to protect the north side against attempts at debarcation on the Katscha and at Eupatoria.

Germany has actively engaged in the fortification of the Baltic and North Sea ports, Dantzic (Neufahrwasser), Memel, Pillan, Colburg, Swinemünde, Stralsund, Kiel, Sonderburg, Düppel, Mouth of the Elbe (Cuxhaven), Mouth of the Weser (Bremerhaven), Wilhelmshaven, and lesser ports. Some of these ports, at least, are provided with material for obstructing the channels. Turrets are noted as provided (one for each) of the two forts at Pillan, and ten turrets at Bremerhaven. Of these latter three are for two guns, each of twenty-eight centimetres; five for one gun each, and two are for two guns each (presumably for land defense) of fifteen centimetres caliber. Kiel has four ranges of torpedoes, and at the mouth of the Elbe, the currents being too strong at the locations of the forts for placing them, another position was chosen, and two batteries were constructed for their defense. Floating batteries are to be used accessory to the defense of Wilhelmshaven, and mortar batteries at Cuxhaven. It is decided to construct batteries and armored turrets to prevent debarcation from hostile fleets in the Bay of Wismar, the most exposed point in this respect on the North Sea coast of Germany. To the defenses of Kiel there is to be added, it appears, "a battery of a special nature,

located below the level of the water, and intended to project torpedoes against vessels attempting an entrance." A German authority refers to it as a new system "which may be styled an offensive obstruction." "Its form is that of a box, of iron, armed with torpedoes, and which may be submerged and operated from the bank by electric communication; one or several of these torpedo batteries will be anchored in the Pass." It is not certain that this engine had gotten beyond the experimental stage in February, 1883, though reported to render good service in practice, and complete trials were to be made in the spring then ensuing. "Sub-marine mines and torpedoes at Kiel are not to be confounded;" the latter are "to be used by ships in their attacks," the former are purely defensive, to be used under the protection of forts.

Antwerp is defended against hostile approach from the sea, by forts, in which casemated batteries, armored batteries and turrets are used. There are three turrets in one of these forts, St. Philipe, two being for two 28 centimetre guns, and one for two 24 centimetre guns. It is reported that difficulties in the operation of the mechanism of these turrets had caused the suspension of work upon similar accessories at Fort La Perle.

The coast defenses of Holland have been strengthened by the construction of turrets, batteries and forts.

Trieste, the greatest commercial city of Austria, since the cession of Venice, has been abandoned as a great war port because of the difficulties of defense and its insufficient shelter for a fleet. Pola has become the great military port. To put it in a state of defense against armored vessels, large works were begun in 1881 and pushed with the greatest activity, for which 8,800,000 francs were allotted, to be expended in three years. The armament will require considerable sums besides. Three armored cupolas form part of the defense, each for twenty-eight centimetre Krupp guns. The anchorage at Lissa is defended by strong sea-coast batteries and forts, though the information does not show any of these to be of recent construction. The defenses for the Gulf of Cottaro, already quite extensive, have been strengthened; works have been constructed for the defense of a line of torpedoes and land defenses are to be added.

In Spain, the Naval Arsenals of Santona and Ferrol on the north coast, and Cadiz on the south, are the only points where activity is noted. At Santona, the fortifications comprising an enceinte and

casemated sea-coast batteries, were commenced, and for Ferrol detached forts were projected, and Fort de la Palma, was finished (in 1881). At Cadiz, numerous batteries have been added, the armament, which is capable of piercing armor fifty-five centimetres thick, in greater part provided, the old forts have been remodeled and new ones have been projected. Armstrong guns, 12-inch caliber, are mounted in barbette upon center pintle platforms, and 10-inch caliber of the same make in casemate. It is the policy to concentrate the defense at a few ports, which are also ports of refuge.

In England, the colossal naval establishments and the most important ports have been covered by gigantic fortifications, the characteristic of which on one part is the most extended use of armor which has been made up to this time, and on the other part their armament is of the heaviest guns known. Particular attention has also been given to torpedoes and the Mediterranean Stations as well as the Channel Coast, and the mouth of the Thames have been provided almost completely with torpedo material. "These principal ports have been fortified on the side of the land as well as on that of the sea. Expense has been no obstacle to the creation of as complete a system as possible in all respects for which there has been allotted from 1860 to 1879 about 190 millions. The budget of 1881–2 had a sum of twenty-five millions for coast fortification. These fortifications are of the general types with which we were made familiar by the report of Generals Barnard and Wright in 1871." (Fabrication of Iron for Defensive Purposes.) The Firth of Forth, mouth of the Thames and of the Midway, Dover, Portsmouth, Plymouth, Milford Haven, Gibralter and Malta are the principal points fortified and strengthened in these later days.

The fortification of Copenhagen has been much discussed for a period of several years, but nothing seems to have been seriously attempted. It is related that a series of experiments undertaken with the view of establishing the value of a defensive engine known under the name of the Zubouitz Land Torpedo, have terminated, and the Rigsdag has granted the necessary funds for the purchase of a certain number of these accessories.

Many other ports, than those mentioned, on the coasts of the various nations, are fortified, but only those are here referred to where fortifications have been added in recent years, and which therefore are more indicative of modern needs and methods.

All the Continental Powers have, for a number of years past, been establishing systems of interior fortresses. These fortresses consist usually of an inclosed nucleus, the enceinte, with a line of detached forts surrounding it. The enceinte incloses within its lines the city with such arsenals, depôts or magazines as may belong thereto, and prevents the success of enterprises which may be attempted through the intervals of the detached works. The detached forts are at such distance in advance as may be demanded by the nature of the position, the topographical features, and the *rôle* the fortress is expected to play in the offensive or defensive, combined with the range of modern artillery. For grand intrenched camps, the detached forts are at such distance as to cover the encampments exterior to the enceinte as well as the establishment of parks of artillery, supply trains, dpôts of supplies, munitions, etc. These works are 4000 to 7250 metres from the enceinte at Ingoldstadt, a mean distance of 6000 metres at Custrin, 4000 metres at Posen, 3000 to 6000 metres at Antwerp, as much as ten to twelve kilometres at Lyons, and several miles at Paris. In other cases the forts are nearer, but lesser distances are permissable only because the positions occupied have great command, either alone or in conjunction with adjacent works.

"Detached works, sufficiently advanced, have the advantage, not only of keeping the enemy beyond range from the nucleus of the fortress, but procure for the besieged the possibility of making an offensive defense; that is to say, of deploying large masses of troops for sorties under the protection of these forts in the space between the enceinte and the line of advanced works, and passing through the intervals with an extended line of battle." It is contemplated, in connection with these detached works, to make use of provisional and field works, the plans and dispositions of which are thoroughly studied in advance. At Rome intermediate retired works are now constructed, or contemplated, to form a second line of defense.

"A place of this kind cannot be neglected by an enemy; its great perimeter exacts a large effective for its investment, thus reducing the effective strength of the hostile forces, while the resistance and disposition of the works compel the investing force to remain inactive before the place for a long time before being available for other operations in the course of the campaign. But the large sums necessary for the construction of places of this

kind, as well as the effective required for the garrisons, prohibit imperatively the establishment of the strongest and most complete fortresses except for the most important places, the possession of which is absolutely indispensable for the conduct of operations in the open field."

Next in extent to these grand intrenched camps are those fortresses which enclose cities, manufactories, depots or establishments regarded as necessary to retain, or *places d'arrêt* commanding important lines of communication, the possession of which is of value to the defense or would be great gain to the enemy.

Lesser points are held by simple *forts d'arrêt*, which, though small in extent, are provided with an armament strong especially in guns of large caliber, amply supplied with bomb-proofs, subsistence, munitions and covered lines of communication.

Important river-crossings are fortified by *têtes du pont*.

Turrets and cupolas are used in land defenses, as at Paris, Metz, Cologne, etc., as well as those of the sea-coast. For the armament of these turrets we learn of guns of fifteen centimetres, at Cologne and Metz, 155 millemeters in the forts at Paris, and 135 millemeters at Manbenge.

Since the War of 1870–71 France has extended the fortifications of Paris, and has established a cordon of fortresses on the north-eastern and eastern frontiers. The additions to the defenses of Paris consist of three groups of fortifications, each group forming, in fact, an intrenched camp. The northern group occupies the heights and plateaux north and north-westward of St. Denis, the left resting on the Seine somewhat more than five miles above the confluence of the Oise, and the right upon a system of inundations to be formed upon that net-work of streams with marshy banks which find discharge into the Seine near St. Denis. There are seven forts in this group, besides batteries and redoubts; the outer forts are nearly eight miles from the enceinte. The easterly group lies in the section between the canal of the Ourcq and the Seine, and consists of a line of forts and batteries, the left flank being a fort immediately in advance of Vanjours, and the right flank a fort near Villeneuve—Saint George on the height between the Yéres and the Seine and above their confluence, with another fort on the heights across the Seine. This line occupies ground in advance of the Marne up to Hoissy-le-Grand. The central portion of the section, "*the tête du pont of the Marne*," is of great importance, the estimated cost of its de-

fense being one-fifth of the 60,000,000 of francs estimated for the completion of the defenses of Paris. This line of defense is from seven to nine miles from the enceinte and from about three to seven miles in advance of the old line of forts, which form a second line of defense or réduit to this section.

The third, our south-west system, as at first laid out, had a front of about ten miles, its left being a group of three forts near Palaiseau, which is about seven miles in advance of the line of Forts Issy and Montrouge, its right being a group of three forts in advance of St. Cyr (about nine kilometres in advance of Versailles). Its left flank is connected by a series of redoubts and batteries with Forts Issy, Vanves and Montrouge, and its right flank by such a series with the Seine, immediately above St. Germain. Two forts, intermediate between the positions of Palaiseau and St. Cyr, complete the framework of this system. Later, the conclusion has been reached to extend the front about five miles to the westward of St. Cyr, and then by a return to connect with the Seine in the bend of Poissy, works connecting the position of St. Cyr with St. Germain being retained.

The abolition of the old enceinte as a line of defense has been talked of, but it is known that the Minister of War opposed this except with the condition that the space between the northern and eastern systems and that between Villeneuve, St. George and Palaiseau shall be closed each by four redoubts, and that the old advanced forts be put in a complete state of defense.

Referring to the map with No. IX. of this JOURNAL, the following forms the new system of French fortresses upon the Belgian, German and Swiss frontiers: Calais and Dunkergen in the extreme north-eastern region; then south-easterly, in order, Lille, Valenciennes, Manbruge, Mezières (with Amiens, La Feve and Laon conjointly, and Reims in second line), Toul, Espinal, Belfort (with Langres in second line), Besançon, with Dijon in rear of it. All of these fortresses have an enclosed enceinte with outlying forts. There are, besides, quite a number of *forts d'arrêt* intermediate to and in advance of these positions.

Lyons, as a grand central stronghold, fortified by a dozen or more forts, besides batteries beyond the old line of detached works, and in part ten to twelve kilometres from the city, with Grenoble and Briançon as *places d'arrêt*, each with several detached forts, form the barrier on the Italian frontier.

The amounts voted for fortifications from 1872 to 1883 aggregate over 400 millions of francs.

"Since the late War, the works of defense of the German Empire have undergone great modifications, to the execution of which, a portion of the War indemnity was allotted." "The War had furnished valuable data of experience, strategically as well as technically. As a consequence the transformation of the fortresses of the Empire became necessary, as well because of the new conditions to be considered in their construction as in the reorganization of the system of defense as a whole. Hence, a Commission of National Defense under the Presidency of the Crown Prince, was charged with the making of projects and plans, and the draft of a new law was presented to the Reichstag as the result of their labors. This draft, in terms, insisted especially upon the fact that the experience of the War had shown the capital importance of fortifications very substantially built and established upon sound principles, and that the condition of the existing system did not respond to modern requirements."

The proposed measures were as follows:

First, the creation of grand central positions for the defense of the country. Second, the abolition of certain portions of the old, existing fortresses. Third, for the most important places to retain a serious amelioration of dispositions and of armament, by the construction of detached forts, the increase and addition of bomb-proof magazines and shelters, the amelioration of the protection of objects and interior spaces; finally, the increase of the Artillery armament especially in rifled pieces.

Appropriations of over 200 millions of francs for the points named in the report of the commission resulted in 1873, and inclusive of armament and munitions, aggregated 270 millions. Certain expenses finally necessary for the establishment of these fortresses were not yet provided for, and "adding these various expenses, we may conclude that the total expenditure foreseen for the transformation, armament, and supply of the German fortresses is not less than 500 millions of francs."

The barrier of the Rhine comprises four grand intrenched camps: Cologne, Coblentz, Mayence, and Strasburg (all being surrounded by new detached forts, and with the exception of Coblentz, receiving enlarged enceintes), a lesser one, Rastadt, and four fortified river-crossings, Wesel, Dusseldorf (Hamm), Germersheim and Brisach; and the strategic deployment in advance of

this line, between the Vosges and the Moselle will be covered by Metz, with Thimville (Diedenhofen) and Sarrelonis, defending the crossings of the Moselle and the Sarre, and the Bitsche as a *place d'arrêt*.

At Metz, the enceinte has been enlarged on the east to include the old outwork, Fort Bellecroix, the ravelin in advance of Fort Moselle has been demolished, and the other outworks to the old enceinte will follow suit at a proper time. The detached forts, St. Julien (now Fort Manteuffel), and Quenlen (now Fort Gorben), left in an unfinished state by the French, have been completed. For the old redoubt, Les Bottes (or Les Bordes), a permanent work, Fort Zastron has been substituted, and another, Fort August de Wurtemburg, has similarly replaced the earthwork St. Privat. All these lie on the east of the Moselle. A new fort, Manstein, has been built on the other extremity of the plateau with Fort St. Quentin (now Fort Prince Frederick Charles); these two works are united by lines, on both sides of the plateau with flanking batteries, and the former is connected by a line of defense with Fort Plappeville (now Fort Alomsleben). A new fort, Kameke, on the heights of Woppy, and another near St. Eloy, Fort Hindersin, complete the encircling line. Fort Manstein has one turret for two fifteen-centimetre guns, and Fort Kameke has two such turrets.

At Strasburg, the citadelle and the enceinte on the southern side to the Ill have been retained, but almost all their outworks have been suppressed. Elsewhere the enceinte has been carried very much in advance of the old line. Fourteen detached forts, from 5,000 to 7,000 yards from the city and surrounding it, three of which are east of the Rhine, have been built.

In Southern Germany, Ingoldstadt and Ulm have recently received additions of detached forts to their fortifications. The former is now a vast intrenched camp, the principal place of arms in South Germany.

Covering the eastern frontier of the German Empire the following system has been adopted: Köenigsberg, a fortress of the first-class, with a reinforced enceinte and thirteen detached forts, with the sea-coast defense and forts at Pillau, cannot be completely invested unless the latter are forced and an enemy's fleet takes possession of the harbor. Thorn has been transformed into a place of arms of the first-class by the construction of detached forts and armored turrets, and with Dantzic (in connection with

Marienburg) as a *place d' arrêt*, holds the line of the Vistula, and lies upon the flank of any advance from Warsaw. Thom and Köenigsberg may be considered as the bases of the defensive system of North-eastern Russia. An enemy cannot think of crossing the Vistula and operating on the left bank thereof until one of these two places be taken. Posen, now a fortress of the first-class, with nine large detached works and three lesser ones, opposes, directly, an advance from the eastward, and completes the fortification of this frontier. Posen is very difficult of investment because of the Metze on the north, the Warthe, upon which it is situated, the Obra on the south, and the extensive marshes bordering on those streams. A service of carrier-pigeons is established here.

The establishment of a *fort d'arrêt* upon the line of rail leading south-east from Köenigsberg, between Lyck and the Russian frontier is under consideration, probably in view of the fortification by the Russians of Grajewo just across the boundary, and Goniadz not far from there.

South and south-east of Berlin no extensive project seems to have been, as yet, inaugurated, perhaps because of the backward condition in which the Austrian defenses appear to be along the line of the German frontier. Glogan, on the line of rail, Berlin to Breslau, has had the enceinte extended. Koenigstein, on the Elbe south of Dresden, is retained as a *fort d'arrêt*. The establishment of a grand entrenched camp for the defense of Upper Silesia is under discussion.

Berlin is not fortified. The project of the Commission of National Defense included the addition of six large detached forts to the defenses of Kustrin on the east, and of four detached forts to those of Spandau on the north, with an enlargement of its enceinte. Little seems to have been done at either place, at least little is known. Torgan and Madgebourg, fortified crossings of the Elbe, assist in this central defense of the empire, but upon neither place has recent work been performed.

Kiel and Wilhelmshaven are surrounded with forts on the land side.

The interior fortresses of Austria have received no additions in recent years to put them in condition to fulfill modern requirements except Olmütz, Cracow, Przemyzl (on the line of rail eastward of Cracow, where it branches off to the south, and to Moskow and Kief on the eastward), and Komorn.

The work at Olmütz consists of an enlarged enceinte and nineteen surrounding forts; that of Cracow of an enceinte built since 1866, and detached forts of recent construction, the latter costing 6,000,000 of francs. The constructions at both places are apparently complete.

Przemyzl will require eleven millions of francs for the construction of its defenses, of which five millions seems to have been appropriated in 1881 to 1884, and the entire sum necessary for its armament provided.

Nothing is known of the new works at Komorn, except that appropriations were made in 1881. Important ameliorations were made several years since to the defenses of Karlsbourg, on the Maros.

Throughout the other portions of the Austrian Empire there are only *forts d'arrêt* more or less ancient; or fortresses of a past age, such as Innspruck, in the Tyrol, Salzbourg, on the Bavarian frontier, Linz, on the route from that frontier to Vienna, and Theresienstadt, on the Elbe, between Prague and Dresden.

The creation of an intrenched camp at Prague was decided upon some years since, but nothing has been done about it.

The fortification of Vienna has been under discussion for a number of years, and the sites of the forts even determined upon, "but the selfish opposition of the inhabitants, who feared in case of War to draw upon their city the horrors of a siege" has successfully prevented the construction.

In Russia a system of modern defense has been carried on. Though the information available is indefinite in many particulars, as well as contradictory, the following is quite evidently certain: Upon the Vistula there are three fortresses, New Georgiewsk (Modlin) at the confluence, with Narewo, Warsaw and Ivangorod. Upon the line of rail south-east from Koenigsburg there are fortifications at Goniadz, a short distance within the frontier, the fortress of Bialystock, near the crossing with the line from Warsaw to St. Petersburg, and the fortress of Brest-Letewski at the crossing with the line from Warsaw to Moskow, and where the latter is joined by the line from Ivangorod. More or less serious consideration has been given to the fortification of other points in the area affected by this group: Radom, west of the Vistula and in advance of Ivangorod; Lublin and Zamosc, south-east of Radom, and Drohyczyn on the Bug, and west of the line Bialystock—Brest-Letewski, are such points. It is quite

probable that a fortified crossing has been established a short distance above the confluence of the Narewo and the Bug, forming a triangle with New Georgiewsk and Warsaw and a fortified position made near Radom.

Upon the line east from Koenigsburg, Kowno has been made a fortress of the first-class; and Wilna, further on, has been under consideration for a similar treatment, but nothing seems to have been accomplished thus far.

The transformation of Dubuo into a grand intrenched camp was begun several years since, and very active operations of the engineers have been reported upon it, as well as upon Puzk and Kowel, which, in connection with Dubuo and the fortified points of Ivangorod, Annapol and Chutin, complete the formidable defense of the frontier of Galicia from Warsaw to Kief.

Additions have been made in recent years to the defenses of Bender—Tiraspol, at the crossing of the Dniester, by the line Kicheuef—Odessa.

Far within these frontier groups there are the three places, Dünabourg on the Dwina, at the crossing of the line Warsaw—St. Petersburg, Bobruisk, on the Beresina, and Kief on the Dneiper. The three streams named form a nearly continuous line across Russia from the Baltic to the Black Sea.

These two volumes of over six hundred pages contain many more items of interest; those here condensed are the most salient, and many details are necessarily omitted.

LEGAL AND TACTICAL CONSIDERATIONS

AFFECTING THE EMPLOYMENT OF THE MILITARY IN THE SUPPRESSION OF MOBS; INCLUDING AN ESSAY ON MARTIAL LAW.

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PART ONE.—LEGAL CONSIDERATIONS.

CHAPTER I.

WHEN TROOPS MAY BE USED.

I. USE OF MILITIA BY THE STATE.

THE Constitution recognizes that a well-regulated Militia is necessary to the security of a free State. In accordance with the fundamental principle that the military shall remain subordinate to the civil authority, it must not, at its own motion, interfere in the preservation of the public peace. The laws of England, and those of nearly every State of the Union, contemplate the request of civil functionaries before the Militia may be called out to assist in the execution of the laws.

And it may be stated as a general principle that, where statutory authority is given to civil officials to call upon the military for aid, it is not necessary that the case should be delayed until every resource of civil authority has been tried and exhausted, or found inadequate; that it is a matter left to the discretion of the official; and when to him the situation shall seem to render the use of troops expedient, he is authorized to request their co-operation.

The laws of some States provide for calls upon the Militia, when the danger is imminent; those of others, when process has been resisted, or the riot or tumult has actually occurred. It will often be more discreet, as it will be more merciful, to make both show and use of the greater power in the inception of difficulty, when resistance is young, and the hesitating are unresolved.

It is of vital importance that soldiers should familiarize themselves with their local State laws on the subject of their military employment. The necessity for this is the more evident when we reflect that we may render

ourselves liable to serious civil and criminal proceedings by an innocent and apparently slight violation of a law that we are supposed to know.

With this caution, the reader is referred to the military code of his State, often printed in the regulations, and therefore easily accessible.

The military laws of some States are much more copious and satisfactory than those of others. In some of the States the governor alone is authorized to call out the Militia; in others, this privilege is extended to various other officials; and again, we find that, in addition to being subject to these calls, the troops may be ordered out by certain military commanders, at their discretion, in time of insurrection or invasion, or imminent danger thereof.

The statutory provisions of New York, which appear to be abreast of the times, are to the effect that, in case of insurrection, invasion, or breaches of the peace, or imminent danger thereof, the governor may order any or all of the troops of the State into active service; that in case of insurrection or invasion, or imminent danger thereof, within the limits of any division, it shall be the duty of the commander of such division to order out the troops, or any part thereof, under his command, and shall immediately report in full to the governor; that in case of any breach of the peace, tumult, riot, or resistance to process of the State, or imminent danger thereof, it shall be lawful for a sheriff or mayor to call upon the commandant of the National Guard stationed in, or adjacent to, the disturbed district, for aid; and it is made the duty of the latter to order out his force, or a part thereof, reporting in full to the governor. The enrolled, or ununiformed Militia, may be drafted into service, by a city mayor or town supervisor, or volunteers may be accepted, under order of the governor, when necessary.

Every member of the enrolled Militia ordered out, or who volunteers or is drafted, and who does not appear at the time and place designated, or who has not some proper substitute, or does not produce a sworn certificate of physical disability, shall be taken to be a deserter, and dealt with as prescribed in the Articles of War of the United States.

II. USE OF FEDERAL TROOPS BY THE UNITED STATES AND BY THE STATES.

SECTION 15, chapter 263, of the laws of 1878, provides:

"From and after the passage of this act, it shall not be lawful to employ any part of the Army of the United States, as a *posse comitatus*, or otherwise, for the purpose of executing the laws, except in such cases and under such circumstances as such employment of said force may be expressly authorized by the Constitution or by act of Congress.

* * * *

And any person wilfully violating the provisions of this section shall be deemed guilty of a misdemeanor, and on conviction thereof, shall be punished by fine, not exceeding ten thousand dollars, or imprisonment not exceeding two years, or by both such fine and imprisonment."

This statute renders it important that a careful and exhaustive search should be made for constitutional and statutory authorizations for the use of the Army; and to provide against possible doubt it is proposed to

enumerate briefly those occasions, whatever their nature, upon which the Army, a part or an individual thereof, may be civilly employed under express enactment.

The constitutional provisions are:

"Congress shall have power to make rules for the Government and regulation of the land and naval forces; to provide for calling forth the Militia to execute the laws of the Union, suppress insurrections, and repel invasions." (Art. I., Sec. 8.) "The President shall be Commander-in-chief of the Army and Navy of the United States, and of the Militia of the several States when called into the actual service of the United States." (Art. II., Sec. 2.) "The United States shall guarantee to every State in this Union a Republican form of government, and shall protect each of them against invasion; and on application of the Legislature, or of the Executive (when the Legislature cannot be convened), against domestic violence." (Art. IV., Sec. 4.)

The first and third of the above quotations show that the forces of the United States may enter a State, under certain circumstances, of its own motion; which, under different circumstances, they may interfere only at the request of the States. The first case includes invasions by a foreign enemy, and insurrection within a State against the Federal authority, or the laws of the United States; and under these conditions involving a defiance of the national sovereignty and functions, the consent of the State is not necessary—in fact, the military power of the Government, inclusive of militia duty called into its service, may enter its borders against its protest.*

In the second case, when the law or the sovereign authority of the State is alone opposed, the application of the Legislature or of the Governor, under the circumstances set forth in the Article, is necessary. It is neither within the power of the President, nor any military subordinate, to interfere in matters of purely local or State concern, until a request has been duly made and complied with. The attitude of United States troops at a time of war or insurrection in violation of the laws of a State should be strictly neutral.†

"Any combined effort by the Military as such to make arrests or otherwise prevent breaches of the peace or violations of the law, in civil cases, except by the order of the President, * * * must necessarily be illegal. In a case of a civil disturbance in violation of the laws of a State, a military commander cannot volunteer to intervene with his command without incurring a personal responsibility for his acts. In the absence of the requisite orders, he may not even march or array his command for the purpose of exerting a moral effect, or an effect *in terrorum*, such a demonstration indeed could only compromise the authority of the United States, while insulting the sovereignty of the State."‡

Article 59 of the Army Regulations enumerates the statutory authorizations for the use of U. S. troops as a *posse comitatus*, and adds:

* Hon. H. Stanbery. Pamphlet on Martial Law, in the Mil. Ser. Inst'n Library.
† Winthrop's Law, vol ii., p. 121.
‡ Digest Op., J. A. Gen'l, p. 114.

Sec. 853. Officers of the Army will not permit the use of the troops under their command to aid the civil authorities as a *posse comitatus* or in execution of the laws, except as authorized in the foregoing enactments. If time will admit, the application for the use of troops for these purposes must be forwarded, with a statement of all the material facts, for the consideration and action of the President; but, in cases of sudden and unexpected invasion, insurrection, or riot, endangering the public property of the United States, or in cases of attempted or threatened robbery or interruption of the United States mails, or other equal emergency, officers of the Army may, if they think a necessity exists, take such action before the receipt of instructions from the seat of Government as the circumstances and the law under which they are acting may justify; and will then promptly report their action and the reasons therefor to the Adjutant-General for the information of the President.

Congress, in accordance with its power to make rules for the regulation and government of the Army, has made it *lawful* for the President to set the military power in motion, to secure to the State the proteetion guaranteed by the Fourth Article (5297 R. S.). This imposes no merely ministerial duty upon him to carry out the Legisature's request;* the language is not that he *shall*, but that it *shall be lawful* for him so to do.

"Where calls are made upon the President * * * by two persons, each claiming to be Governor of the same State, to protect the State against domestic violence, it of necessity devolves upon the President to determine before giving the required aid, which of such persons is the lawful incumbent of the office."†

The provisions of the 4th Article do not apply specifically to the Territories; while this is so, because of their anomalous position, yet the principle that the forces of the General Government should not be obtruded into a community contrary to its wishes to regulate local concerns, would seem to be fundamentally a rule of freedom, and of general application.

The powers and responsibilities included within the above quoted sections of the Constitution, have been the subjects of Congressional enactment. It will be found that the President, in his capacity as Commander-in-Chief, has been vested largely with the power of determining upon what occasions the Army shall be used. And since it is to Congress that the power is given to provide rules and regulations,‖ it follows that the President is limited and controlled in his action by any general or special law, which Congress has enacted, or may choose to enact in regard to the forces.§

The following is an enumeration of the occasions upon which the Army, or a part of it may be used, under the laws of Congress.

Sec. 5297, R. S. "In case of an insurrection in any State against the Government thereof, it shall be lawful for the President on application of the legislature of such State, or of the executive, when the legislature cannot be convened to call forth such number of the militia of any other State or States, which may be applied for as he deems sufficient to suppress

* Hon. H. Stanbery's pamphlet, *ante*.
† 14 Op. Att'y Gen.
‖ Art. 1, sec. 9.
§ Am. Law Reg., Vol. IX, 504.

such insurrection; *or on like application, to employ, for the same purposes, such part of the land or naval forces of the United States as he deems necessary.*"

Sec. 5298. "Whenever, by reason of unlawful obstructions, combinations, or assemblages of persons, or rebellion against the authority of the Goverment of the United States, it shall become impracticable, in the judgment of the President, to enforce by the ordinary course of judicial proceedings, the laws of the United States within any State or Territory it shall be lawful for the President to call forth the Militia, or of any, or all of the States, *and to employ such parts of the land and naval forces of the United States as he may deem necessary* to enforce the faithful execution of the laws of the United States, or to suppress such rebellion, in whatever State or Territory thereof, the laws of the United States may be forcibly opposed, or the execution thereof forcibly obstructed."

Sec. 1642. "Whenever the United States are invaded, or are in imminent danger of invasion from any foreign nation or Indian tribe, or of rebellion against the authority of the Government of the United States, it shall be lawful for the President to call forth such number of the Militia of the State or States most convenient to the place of danger, or scene of action, as he may deem necessary to repel such invasion, or to suppress such rebellion and to issue his orders for that purpose to such officers of the Militia as he may think proper."

Sec. 5299 refers to insurrection, domestic violence, unlawful combinations or conspiracies in any State, depriving any portion or class of the people of any rights, privileges, etc., named in the Constitution; and provides for the calling out of the Militia, Army and Navy, when the State cannot, or does not, protect, or the due execution of the laws of the United States is impeded.

Sec. 5300. "Whenever in the judgment of the President, it becomes necessary to use the military forces under this title, the President shall forthwith, by proclamation, command the insurgents to disperse and retire peaceably to their respective abodes, within a limited time."

Sec. 5287 provides that the land and naval forces may be used by the President or person empowered by him to enforce the neutrality laws.

Sec. 5288, to compel a vessel violating the neutrality laws, to leave.

Sec. 4792 provides that the military shall faithfully aid in the execution of quarantine and health laws as directed by the Secretary of the Treasury.

By Sec. 5316, the President is empowered to use the Army to prevent the taking of a vessel detained at an insurrectionary port by customs officers.

Under the Civil Rights Act, commissioners of the Circuit Courts or Territorial Courts—Sec. 1984, R. S., may appoint in writing, persons to execute warrants or other lawful process, "and the person so appointed shall have authority to summon nd call to their aid the bystanders, or *posse comitatus* of the proper county, or such *portion of the land or naval forces of the United States*, or of the Militia, as may be necessary to the performance of the duty with which they are charged.

Sec. 1989. "It shall be lawful for the President of the United States,

or such person as he may empower for that purpose, to employ such part of the land or naval forces of the United States, or of the Militia, as may be necessary to aid in the execution of judicial process, issued under any of the preceding provisions, or as shall be necessary to prevent the violation and enforce the due execution of the provisions of this title."

In the following sections the words "Indian country," will be understood to mean, as defined by the Supreme Court, in the Case of Crow Dog, 109, U. S., "all the country to which the "Indian title has not been extinguished within the limits of the United States, whether within a reservation or not."

Sec. 2150, authorizes the use of the Army "in such manner and under such regulations as the President may direct."

1st. In the apprehension of persons in Indian Country, without authority and the conveyancy to the civil authorities to be proceeded against.

2d. In the examination and seizure of stores, packages and boats unauthorized by law.

3d. In preventing the introduction of persons and property into the Indian Country contrary to law; which persons and property shall be proceeded against according to law."

* In the case of the Poncas who settled on the reservation of the Omahas, General Crook ordered their removal and their return to the Indian Territory.

The Court, in U. S. *vs.* Crook, 5 Dillon, held it to be his duty to deliver them to the nearest civil authority to be proceeded against; that he had no authority to return them.

"In violation of law," in sense of Section 2150, R S., was held, in XIX Op. Attorney-General, to include a case where men were upon an Indian reservation contrary to a treaty between the Government and the Indians.

Sec. 2052 provides that the President may direct the military to arrest Indian criminals or prevent hostilities between Indians.

Sec. 2062. "The President may designate an officer to act as Indian agent; and, by act of June 23d, 1879, may detail one to act as instructor of Indian youth."

Sec. 2118. "The President may employ the military in removing persons attempting to settle on, or survey, or designate boundaries of lands belonging to Indians."

Sec. 2147. "The President may use the military to remove unauthorized persons from Indian reservations."

Miscellaneous provisions for the use of the Army are found in the following sections of the Revised Statutes:

5275 authorizes the President to use the Army and Navy in the protection and safe-keeping of persons extradited for trial.

2001 provides that when any citizen is unjustly deprived of his liberty by a foreign government, and his release shall be demanded and refused, it shall be lawful for the President to use the Army and Navy in any manner short of acts of War.

Sections 2002, 5528, and 5529, make it unlawful for an officer to take

* *In re* Carr, 3 Sawyer: Waters *vs.* Campbell, 5 Sawyer.

troops to an election-place, except to repel armed enemies of the United States and keep the peace; and provides penalties for any officer who shall prevent or attempt to prevent any voter from exercising the right to vote.

1991, that every person in the military service in the Territory of New Mexico shall aid in the enforcement of Section 1990, concerning peonage.

2460 authorizes the use of the military by the President in preventing the felling or removing of United States timber in Florida.

5577 provides for the use of the Army in the protection of the discoverer, or the widow of the discoverer of Guano islands, in their rights.

1959 authorizes the Secretary of War to remove persons from certain Alaskan islands reserved for the purposes of the Government.

Officers of the Army of the United Staies may be detailed, under Section 2190, by the Secretary of War, to take the census; and by the President, under Sections 4684–5, to assist in the topographical work of the Coast Survey.

By sections 1222–3–4–5, officers of the Army are forbidden to hold any civil office, whether by election or appointment; or any consular or diplomatic office; or to be employed on civil works or internal improvements, or to engage in the service of any incorporated company, if such service or employment shall interfere with their military duties or separate them from their regiments or corps.

The foregoing is an enumeration of the express authorizations in the Constitution and Laws of the Uuited States, for the use of its forces.

Any employment of the Army, or a part thereof, not so authorized, would be illegal, and might subject the officers concerned to serious liabilities.

The former practice of the Government in permitting the military forces of the United States to be used as a part of the *posse comitatus* of the marshal, when it was considered necessary that he should have their aid in the enforcement of process, was thought to be sustained by the judiciary act of 1789, giving to the marshal "power to command all necessary assistance in the execution of his duty." This practice was declared to be in accordance with law by Attorney-General Evarts, in August, 1868, who called attention to the fact that the military, in such case, obey the summons of the marshal as a *posse comitatus*, and act in subordination and obedience to the civil officer, for the purpose of enforcing the execution of process. This was changed, however, by the act of 1878; and now, as said by the Attorney-General in sixteen opinions, page 162, "there is found no express authority by which the marshal may summon any military force of the United States as a part of the *posse comitatus*;" but it is there held that, under Sections 5298 and 5300, the forces may be used for the enforcement of the laws, under the marshal, if the President shall deem proper to take certain additional steps, and if resistance to the laws shall continue.

In the nine opinions of the Attorney-General, 476, it was held that the law of 1878 did not interfere with the authority of the President to employ a necessary military force to remove trespassers from a military reservation.

Having quoted the Constitutional and statutory provisions, referring to the use of the national forces in a State, at the request of the Legislature

or governor thereof, a further question of considerable importance remains to be considered: How far are the troops furnished held to be under the command or direction of the State Executive?

In the labor riots of 1877 troops were sent into West Virginia with orders to report to its governor for directions; to Maryland with similar orders, and to Pennsylvania with directions to act under the orders of the governor, as in Maryland and West Virginia.

Col. E. S. Otis, in an article in the JOURNAL OF THE MILITARY SERVICE INSTITUTION, June, 1885, says:

"Both the General and State Governments acted upon the theory that United States Troops must be turned over to State Executives and remain under their supervision until the riots should be suppressed."

Colonel Otis (p. 123) characterizes this as a novel proceeding, and adds:

"We cannot discover any authority for this proceeding. Neither the Constitution nor Congress ever *expressly* authorized the President to turn over troops to the Governors of States, and we do not think that that particular method of employment of them had ever been seriously contemplated."

The opinion of Gen. Hancock, as quoted by the same authority, concerning the use of the Army, is:

"In fine, when it is employed for State protection, he (the President) must employ it, and must either himself be present in person to command, or place it in charge of one of his duly-commissioned officers, whom the law has given him for such purposes, and who is obliged to direct it according to general instructions."

In these views the Digest of Opinions, Judge Adv. Gen., coincides. (page 112):

"3. A military force employed according to Article IV., Sec. 4 of the Constitution, is to remain under the direction and orders of the President as Commander-in-chief and his military subordinates; it cannot be placed under the direct orders or exclusive disposition of the Governor of the State."

Col. Winthrop, in his recent work, (vol. ii., page 107,) says:

"The troops are not furnished to the Governor as a posse, nor can they legally be placed under his command, or that of any other State official, civil or military.

Though employed in a *quasi* civil capacity and for a local and temporary object, they are still United States Troops, representing the sovereignty of the United States, and can duly act only under the command and direction of the President and their own officers."

The position taken by the writers quoted is thought to be unassailable. In expressing this opinion, it is desired to draw attention to the distinction between what may be called acting under the Governor's command, and acting under his direction. In the former sense, that the executive's wishes concerning the use of the troops may be communicated in the shape of orders, to be obeyed as would be those of the Commander-in-chief, it is thought there will be general concurrence of opinion that the authority cannot be delegated to the Governor.

This, because there is no express authorization for such use, and because of the relation existing between officers under the laws, from the highest to the lowest; all with their positions well defined, and forming, together, a continuous chain of authority from the President to the junior subaltern.

In the sense that the President may direct the troops to act in co-operation with the Governor, accommodating themselves in his views, and supporting his measures, it would seem that a different rule would obtain.

Col. Otis (JOURNAL MIL. SERVICE. INST. xxii., p. 124,) says that "The United States in participating, does so as the superior or controlling force, not as a subordinate or assistant."

And again, "It is not in the nature of a request to assist the State, but a confession on the part of the State that it is unable itself to do so."

Col. Otis quotes the views of Gen. Hancock, as suggested to the Secretary of War in 1877, *viz:* "My impression is, that when State Governments declare their inability to suppress domestic insurrection through the ordinary channels, and call upon the President of the United States to intervene, he should not do it through the civil powers of the States, which have already failed, but by the intervention of the Federal authorities by military force, himself exercising the control."

The writer ventures to differ with the authorities with hesitation, but with a strong conviction that their views do not correctly express the relation between the States and the Federal troops called to its assistance. The position that the request for aid is a confession of failure is deemed to be erroneous. It has been customary for local civil officials to call upon the military as a moral power, often before a blow has been struck, and, in nearly every case, before any adequate show of their power has been made; certainly, before it has been exhausted. Their call for troops has seldom been construed as a declaration of inability to cope with the mob; and when the military has interposed, it has done so in our history and that of England, in aid of, and, in a general way, in subjection to the civil authority. This has been the practice, because it has been realized that it would be fatuous to risk the probability of a long struggle and resulting defeat when the difficulty might be speedily and mercifully adjusted by the moral influence and decisive action of the troops.

The cases are thought to be strictly analogous; the Governor and the State forces bearing the same relation to the counties as the President and the Army do to the States. Any other rule would contravene the constitutional principle that "The military is, and in all cases and at all times ought to be, in strict subordination to the civil power."

In number 43 of *The Federalist* it is asked, concerning domestic violence, "If the authority of the State ought, in the latter case, to protect the local magistracy, ought not the Federal authority, in the former, to support the State authority?"

And, apropos to the proposition that a call upon the United States is made only when State resources have been exhausted, is the statement there made that it would be much better that domestic rioting should be repressed by the Federal authority than that the State should be left to maintain their cause by a bloody and obstinate contest.

It is believed that such a view presents no practical difficulties; that the same relation will exist between the military and the civil authorities in this case as in others; that one exercises a general supervision indicating the objects to be attained, while the other, still subject to the Articles of War and the requirements of military duty and discipline, assists in the accomplishment of these objects, as far as practicable, that the measures to be taken rest in the discretion of the commanding officer, who is, however, liable to court-martial, if he fails to support and assist the civil authorities in their efforts to execute the laws.

3. FEDERAL USE OF THE MILITIA.

In treating the subject progressively, we have considered the calling out of the Militia as the first step, the request for Federal assistance as the second, and now reach the consideration of the third—the Federal employment of the Militia.

The constitutional provisions applicable are:

The Congress shall have power to provide for calling forth the Militia to execute the laws of the Union, suppress insurrections, and repel invasions.

To provide for organizing, arming and disciplining the Militia, and for governing such part of them as may be employed in the Service of the United States, reserving to the States, respectively, the appointment of the officers and the authority of training the Militia according to the discipline prescribed by Congress. (Art. I., Sec. 8.)

The President is Commander-in-chief of the Army and Navy, and of all other land and naval forces called into the service of the United States. (Art. II., Sec. 2.)

Congressional enactments under the above delegations of authority are found in sections 5297, 5298, 5299, 5300, 1984 and 1989, quoted in the preceding chapter. Under Section 5297 it will be observed that the President, in calling out the Militia at the request of a State, is restricted to the Militia of any *other* State or States. Section, 5298 provides for the case of obstruction to the course of judicial proceedings under the laws of the United States, in which event, as previously observed, the military power of the Government, inclusive of militia duly called into the Service, may enter the borders of a State against the latter's protest.

Sections 1984 and 1989 refer to acts made unlawful by the Civil Rights act, and provide for the use of the military, army and militia, in the execution of process.

It has been seen that the words of Sec. 5297 are that, *it shall be lawful* for the President, etc., to call out militia and regulars, and that, therefore, it is left to his discretion to determine upon what occasions Federal assistance shall be furnished to a State in response to its request. A material question of a kindred nature arises under Section 5298: By whom is the exigency to be decided? Is the President constituted the sole and exclusive judge, or is it to be considered an open question to be decided by every officer to whom the President's orders shall be given.

The question was decided by the Supreme Court in Martin *v.* Matt, 12

Wheaton, that the authority to decide "belongs exclusively to the President; and that his decision is conclusive upon all other persons." Nor is it necessary now, as formerly, that the President should act only upon a certificate from a United States judge, that opposing combinations were too powerful to be suppressed by the ordinary course of procedure."*

The President may issue his orders for calling out the Militia to the chief magistrate of the State, or to any Militia officer he may think proper.†

A question of much practical value remains to be determined, *i. e.*, when the President calls upon a State to furnish a certain number of Militia to be used in the Service of the United Srates, may the Militia already armed and equipped be ordered out, or is it necessary to derise the quota from the body of eligible citizens by some uniform rule under which the enlisted Militiaman and his neighbor will stand equal chances of selection?

The principles governing the matter seemed to be as follows:

The Constitution‡ specifies that Congress shall have power to provide for organizing the Militia.

Under this power Congress has provided ‖ that, "Every able-bodied citizen of the respective States, resident therein, who is of the age of 18 years and under the age of 45, shall be enrolled in the Militia." And has further provided that where, by reason of defect or failure, it shall be found necessary to provide for enrolling the Militia, the President is authorized in such cases to make all necessary rules and regulations; and "that the enrollment of the Militia shall in all cases include all able-bodied male citizens between the ages of 18 and 45, and shall be apportioned among the States according to population." §

Again, the Constitution provides that the United States shall guarantee to every State a republican form of Government, shall protect each of them against invasion, and, upon application, against domestic violence; and, further, shall have power to provide for calling forth the Militia to execute the laws of the Union, suppress insurrections and repel invasions. Under this grant of power, Congress has provided that the President, in case of invasion or rebellion,¶ may call forth such number of the Militia of the State or States most convenient to the scene of danger (or of any or all the States**), as he may deem necessary, and to *issue his orders for that purpose to such officers of the Militia as he may* think proper; and in case of domestic violence against a State, upon due application to call forth such number of the Militia of any other State or States as he may deem efficient.

But, when the Militia of more than one State is called into the actual service of the United States by the President, he shall apportion them among such States according to representative population.

The conclusions would seem to be, first, that the Militias of the States

* Rawle's Const'n, 156.

† Houston *v.* Moore, 5 Wheaton, 15; Duffield *v.* Smith, 3 Sergeant and R., 590; Story on Constitution, vol. ii., sec. 1212.

‡ Art. I., sec. 8.

‖ Sec. 1625, R. S.

§ Sec. 1, July 17, 1862, Chap. 201.

¶ Sec. 1642, R. S.

** Sec. 5297, R. S.

included every able-bodied male citizen between the ages of 18 and 45. This is in accordance with the decision of the Supreme Court in a recent case* that: "It is undoubtedly true that all citizens capable of bearing arms constitute the reserve military force or Reserve Militia of the United States, as well as of the States."

Second, that the President may either make rules and regulations for enrolling those liable to militia duty, and call out the force so raised, or a part thereof designated by him, or selected under general rules established by him; or may call out such part of the Militia already organized or enrolled, as he may see fit—which would certainly be the case under Sec. 1642, and presumably under Sec. 5297 of the Revised Statutes.

In case the troops were not personally designated by the President, or his proper representative under his orders, and a requisition were made upon the Executive of the State for a certain quota of troops, it is believed that the Governor would have authority to designate such organizations of Militia as he saw fit for such service unless, indeed, the matter were regulated otherwise by State statutes.

In certain emergencies, at the discretion of the President, the Militia of various States becomes a national force, and it is certainly no unreasonable rule that that official should be permitted to choose for immediate and serious duty troops armed and disciplined in preference to a horde without drill or discipline. Nor will it be forgotten that it is largely due to the annual appropriations of Congress that the efficiency of State troops is maintained.

While this is the case, the Militia has been, and will be, no doubt, usually called forth by means of requisitions made upon the Governor by the President, in which the number of men and officers will be stated.†

The Constitution‡ prohibits any State keeping troops in time of Peace without the consent of Congress, and Congress has never permitted the States to maintain an armed force, except under the provisions of its militia laws. It would therefore seem that the military force of the State, whatever its name, whether National Guard or something else, is the Militia of that State, and as such, liable to call.

The President may specify the time for which the Militia will be required, not to exceed nine months; and is authorized to make provisions for enrolling, where such provisions do not exist, or remain unexecuted, all able-bodied citizens between 18 and 45—apportioned among the States according to population.‖

And militia when drafted may be forced to the rendezvous, and into military subjection,§ and every officer, non-commissioned officer, or private of militia failing to obey the President's call, may be court-martialed, and, if convicted, made to suffer certain enumerated penalties.¶ "This is a re-enactment of Sec. 5, Feb. 28, 1795, under which the Supreme Court has held that

* Presser v. People, 116 U. S., 252.
† Mass. Req's. 15, 2369.
‡ Art. 1, Sec. 10.
‖ Statute, July 17, 1862, chap. 201.
§ McCall's Case, 5 Phila., 259.
¶ Act July 29, 1861, Sec. 4, Chap. 25.

the General Government, and the States respectively, had concurrent jurisdiction to punish such militiamen as failed to obey the President's call; that courts-martial, convened for that purpose, derived authority from the act under consideration, and *not* from the Articles of War, and that as no provision was made for the Constitution of such courts, the usages of the Military Service should obtain in reference thereto; that authority of such tribunals did not expire with determination of exigency under which Militia had been called out; and that there was no law requiring that sentence of such Court should be approved by higher authority; but after the Militia had entered the Service of the United States, the authority over it, of the general Government became exclusive; 'over the National Militia the State governments never had, or could have jurisdiction. None such is conferred by the Constitution of the United States; consequently none such can exist.' Courts-martial for the trial of its members must then be constituted under the Articles of War.—Houston *v.* Moore, 5 Wheaton 16-31; and Martin *v.* Matt, 12 Wheaton 34-38."*

It was formerly held that to bring the Militia within the meaning of being "employed" in the United States Service, that being the word used in the old statute, there must be an obedience to the call, and some acts of organization, mustering, rendezvous or marching done;† or, that the employment did not begin until arrival at the designated rendezvous.‡

The point became important since the old law provided that militia employed, etc., should be subject to the Rules and Articles of War. "It seems, however, that under the law, as it now stands, the Militia are subject to national control, under military law, upon being called into service."‖ The law here referred to, provides "That the Militia so *called* into the service of the United States shall be subject to the same Rules and Articles of War as the troops of the United States, until discharged by the President. * * * * That the Militia so *called* into the Service, * * * shall, during their time of service, be entitled to the same pay, rations and allowances for clothing as are or may be established by law for the Army of the United States."§

But, it is to be observed, that the act of January, 1795, provides for pay to begin from the date of appearance "at the places of battalion, regimental or brigade rendezvous."¶

Rules and regulations for calling out the Militia and enrolling them, will be found in the United States Statutes.

The 64th Article of War provides that, "the officers and soldiers of any troops, whether militia or others, mustered and in pay of the United States, shall, at all times and in all places, be governed by the Articles of War, and shall be subject to be tried by courts-martial." Sec. 1658, R. S., provides, further, "courts-martial for the trial of militia shall be composed of militia officers only." The term Militia officers is held, by the Judge Advocate

* Scott's Digest of Mil. Laws, p. 333, n.
† Story, Cont'n, 1213.
‡ Houston *v.* Moore 5, Wheaton 20.
‖ Scott's Digest, 331 n.
§ Law, July 29, 1861, Chap. 25, Sec. 3.
¶ Chap. 9, Sec. 3.

General, to be synonomous, so far as the organization of a court-martial is concerned, with volunteer officers. "Regular officers, holding commissions in the volunteer forces may be detailed on general courts-martial for trial of volunteers." *

Concerning the command of the Militia when in the service of the General Goverment, it was held by several States, in 1812, that the Militia had the President alone over them. Judge Cooly, in a note to Story on the Constitution (subject—Militia), says that this doctrine is now abandoned.

This point received executive construction, Sep. 27th, 1862, in connection with the law of July 17th, 1862, providing that the Militia, called into service, shall be organized in the mode prescribed by law for volunteers, *viz.*, that "the organization must be by batteries and regiments, and the officers of such batteries and regiments are to be appointed by the State; but the brigade, division, and army corps commanders are to be appointed by the President." †

The 124th Article of War provides that, "officers of the Militia of the several States when called into the service of the United States, shall, on all detachments, courts-martial, or other duty, wherein they may be employed in conjunction with the regular or volunteer forces of the United States, take rank next after all officers of the like grade in said regular or volunteer forces, notwithstanding the commissions of such militia officers may be older than the commissions of the officers of the regular volunteer forces of the United States."

"But officers of volunteer forces, though serving under State commissions, are, when mustered into the service of the United States, upon the same footing as to rank, etc., as regular officers." ‡

But militia and volunteer officers may sit on courts-martial for the trial of regular officers. §

* Digest on 97th Art.
† Scott's Digest, p. 332.
‡ Scott's Digest, 241, n.
§ Winthrop, 85.

CHAPTER II.

RULES GOVERNING THE USE OF TROOPS.

I. SUBORDINATION OF MILITARY TO CIVIL AUTHORITY.

LORD MANSFIELD, in Burdett *v.* Abbott,* said: "If it is necessary for the purpose of preventing mischief, or for the execution of the law, it is not only the right of soldiers, but it is their duty, to exert themselves in assisting the execution of a legal process, or to prevent any crime or mischief being committed. It is therefore highly important that the mistake should be corrected which supposes that an Englishman, by taking upon him the additional character of a soldier, puts off any of the rights and duties of an Englishman."

We are told† of this doctrine, that it means that the presence and aid of the soldier might be justified, on the ground that a man, by becoming a soldier, has not put off any responsibility in matters purely civil. If it goes further and asserts that soldiers, as an organization, may interfere at pleasure on occasions of public disturbance, the doctrine does not receive the sanction of authority or practice, either in England or this country. Soldiers are subject to the Mutiny Act, or the Rules and Articles of War, and any refusal to obey orders would subject them to trial for insubordination or mutiny. It is not that the man, by becoming a soldier, ceases to be a citizen, but that he takes upon himself additional duties. In one case, he is a private citizen; in the other, a citizen in office, responsible not only to the general rules that would govern him in the first instance, but to the special laws and rules made to suit his increased responsibilities.

And not only must soldiers await the orders of their superior officers, but those in command are strictly limited in the manner and occasion of the use of troops, by the laws of Congress and the various Legislatures.

It will be found to be a universal rule that the military, except in time of War or during martial law, are to be employed in subordination to the civil. This rule is the result of the relation existing between the two: the civil power, the conservator of popular rights, the chief authority of a free State; the military power, its coadjutor, called by it into action, and, in due time, relieved by it from further intervention. As we proceed, it will

* 4 Tauntor, 449.

† Clode's Military Forces of the Crown, II., p. 142.

be pointed out that this view entails no inconsistency; that while the civil power directs, it does not interfere.

This relation is to be traced back to the earliest uses of military, when, in England, the warrant of the King, or Secretary of War, was issued to the troops with instruction to repel force by force "in case the civil magistrate should find it necessary;"* that troops were to be used only upon requisition made by the civil magistrate, and for their assistances.

In the Whisky Rebellion, Washington informed the Army that "they should not consider themselves as judges or executioners of the laws, but as employed to support the proper authorities in the execution of them."† In this case, Congress authorized the raising of troops for one purpose: the support and assistance of the civil authorities in their effort to execute the law.‡

The Governor of Massachusetts instructed General Lincoln, at the time of the disturbance in that State in 1787, as follows: "Consider yourself in all your offensive operations constantly as under the direction of the civil officer, saving when any armed force shall appear and oppose your marching to execute these orders."

Maj.-Gen. C. J. Napier§ set forth views concerning the relative functions of the two powers, which have been extensively adopted by military men, both in England and America.¶ He said: "That in riots the civil and the military powers should not act together;" that the constable and his force should operate until powerless, and that then the military should be evoked; that the period of argument and entreaty should be left to the magistrate—that of action, to the troops. For his action the soldier should be responsible under his code to his military commander or to Parliament, but that he should not be liable to trial by jury for anything he may have done in executing the duty imposed upon him by the civil magistrate, except in cases of cruelty; otherwise, a soldier must be "expected to be at once lawyer, soldier, magistrate, patriot, executioner."

However desirable it may seem to the military mind that the sphere of the military should be distinct, that it should not be called upon until *wanted*, and be then permitted to undertake the quelling of the mob in its own way, yet we find the law otherwise, and to the laws as they are written in the statute book, and to settled and adjudicated military customs, as we find them, there must be submission. There is one feature of the above proposition that seems to oppose experience, and that is the contention that the constables should strive, until overcome, before the military is used. Lord Mansfield said it was the highest humanity to check the infancy of tumult; and it is believed that the experience of subsequent years have more strongly settled the correctness of this position.

Accepting the doctrine, in its general enunciation, that the military power is subordinate to the civil power, there remains to be determined more precisely the limitations of their respective functions.

* Clode Military Forces of the Crown. II., 133.
† Am. Law Register, Vol. IX., p. 506.
‡ 1 Stat. at large, 403.
§ London, 1837.
¶ Journal Mil. Serv. Institution, XVI., 361.

It may be asserted, in the first place, that the command of a magistrate cannot exempt the soldier from military discipline; that assistance rendered is in obedience to the exercise of military duty*; that, therefore, soldiers and officers must look to their superiors for orders.

It was laid down in general orders† that troops serving in the posse of a U. S. Marshal, when such service was lawful, to assist and co-operate with him in the enforcement of the process committed to him for execution, should regard themselves as under the command of their military superiors, and directly responsible to the latter, as on other occasions of the performance of military duty and service.

This principle is recognized in the regulations of many of the States. In Massachusetts it is set forth in these words (Par. 2,300): "The civil officer communicates with the superior military officer; subordinate military officers look to their military superiors for orders."

And this may be accepted as the rule, both of reason and practice.

The extent to which the civil officer may direct the troops, through their commanding officer, is a question formerly shrouded in much doubt, and for this reason has been the subject of many erroneous views. It seems to be well settled now that the relation is very much as Maj.-Gen. Napier desired it to be, as expressed in these words: "*How* to use this force is his (the soldier's) trade; but it is not his trade to decide *when* it should be used against his countrymen. He may play the part of the druggist, but that of the physician appertains to the magistrate."

The regulations of Massachusetts, on this important subject, provide:

(Par. 2299.) "While the instructions of the civil officers are given *in general terms to accomplish a particular purpose, and the mode and means* are within the discretion of the military commander, the latter, to prevent misunderstanding, should request to have his instructions reduced to writing."

(Par. 2298.) "The civil officer is not authorized to interfere in any way with the formation or details of the force, the military officer being held responsible for the success of the operations to be undertaken; and it is for the latter, and *for him alone to judge in what manner the troops shall effect* the *object which* the *civil officer has indicated*, and to direct the force in the execution of the service in which it is engaged."

These provisions, which are found in the regulations of many of the States in identical or similar language, are not regarded as modern in their inception, but are viewed as the declaration of the respective fields of action of the two powers, as they necessarily exist in their inherent natures. Indeed, the principles they enunciate have regulated largely the employment of the troops from times immemorial; there has been, unquestionably, much uncertainty as to the line of demarcation, but this has resulted from the fact that the subject often has not been pursued to its legitimate conclusions.

The subordination of the military to the civil; the prescriptive right of the latter to invoke the aid of the former, and to remand it, when the occa-

* Clode Mil. Forces, II., 43.

† Digest Op., J. A. Gen'l, 381.

sion for its use has passed, and to direct its employment within the limitations that directions must be communicated to the superior officer present, and be general in their nature,—indicating the object but not the method,—is conceived to be the well-established and reasonable rule for the use of soldiers in times of Peace.

II. ACTING UNDER ORDERS.

The mind of every soldier who is called upon to aid in the suppression of civil disorder, is disturbed by thoughts similar to those of Col. Axtell, who said, "The General saith, go to such a place, stay there; if I refuse, by the law of War, I die; if I obey, I am in danger likewise." The dual responsibilities of the soldier, place him, as it were, between two fires; if he tread the line carefully, he will keep out of range, but if he swerve to either side, he will tread on dangerous ground. Not only must he observe closely the civil rights of all persons he encounters, but, in his own profession, he must tread the exact line between excess and failure of duty. On the one hand, he may suffer civil and criminal liabilities; on the other, court-martial.

It is believed, however, that the law on this subject will be found to be based on reason, and that impossible things are not asked of the soldier.

Many cases are found both in the English Reports and our own, where acts beyond the authority of military officers have been punished.

It is, then, of the utmost importance to ascertain what rules will be applied to the case of a soldier, who stands as a defendant in a court of law, indicted or sued for some act either ordered by him, or done by him under the orders of a superior in the performance of *his military duty*.

The general principles, subject to the qualifications hereafter stated, is, that illegal orders of a superior are no protection to an inferior. *

"So far from such an order being a justification, it makes the party giving the order an accomplice in the crimes. For instance, an order from an officer to a soldier to shoot another for disrespectful words merely, would, if obeyed, be murder in both. †

This being the general principle, the qualification is found expressed in the words of Mr. Justice Willes: ‡ "I believe the better opinion to be, that an officer or soldier acting upon the orders of his superior, *not being plainly illegal*, is justified; but if they be plainly illegal, he is not justified." Clode, in his work on the Military Forces of the Crown, sustain this view.§ Col. Otis states the rule to be, that an inferior must be held justified in obeying directions not obviously improper or illegal, where he acts honestly upon what he deems not unreasonably to be the effect of the orders.

Sir Charles Napier said of the proposition, that an order not plainly illegal, does not justify, that, "If such is law the Army must become a deliberative body, and ought to be composed of attorneys, and the Lord-Chancellor should be Commander-in-chief." The orders of the superior

* Skeen *v.* Monkenner, 21 Indiana 1; 47 Barbour, 335.

† U. S. *v.* Carr, 1 Woods, 483.

‡ Keighley *v.* Ball, 4 Fos. and Fin., 763.

§ II, 152.

must be manifestly illegal to create responsibility to the inferior;* nor is the inferior bound to go behind an order, thus apparently lawful, and satisfy himself by inquiry that his commanding officer proceeds upon sufficient grounds;† and, if it turns out that his superior had secretly abused or exceeded his power, the superior, who is thus guilty must answer for it, and not the inferior, who reasonably supposed he was doing his duty.¶

"The first duty of a soldier is obedience, and without this there can be neither discipline nor efficiency in an Army. If every subordinate officer and soldier were at liberty to question the legality of the orders of the commander, and obey them or not as they may consider them valid or invalid, the camp would be turned into a debating school, where the precious moment for action would be lost in wordy conflicts between the advocates of conflicting opinions:" ‡

"Except in a plain case of excess of authority,§ *where at first blush it is apparent and palpable to the commonest understanding that the order is illegal*, I cannot but think that the law should excuse the military subordinate, when acting in obedience to the orders of his commander."

The order must expressly and clearly show on its face, or in the body thereof, its illegality; and this must appear at once to a common mind, on hearing it read or given; nor has the inferior a right to inquire of the superior the object and purpose he has in view.‖

Therefore, upon the whole, the right conclusions would seem to be, that if the command is illegal and obviously so, the inferior cannot be held harmless in obeying it; if illegal, and not evidently so to the ordinary understanding, the inferior will be absolved from liability; if legal, and yet the inferior conscientiously believe it to be illegal, and he disobeys it, he would be triable by court-martial, since it would be dangerous to permit a soldier to shelter himself under the plea that he mistakingly believed the order to be contrary to law; and if it is illegal but not obviously so, and the soldier disobeys, he cannot be held answerable for his disobedience.¶

"The habit of discipline and obedience in a soldier is, I believe, more essential to the well-being of the State than the possibility of his now and then executing an illegal order is injurious to it." ‡

The same view is expressed by Kent, who says that "Private mischief is to be endured rather than public inconvenience."

III. GIVING ORDERS.

Likewise, when we come to consider the rules by which the superior will be judged, we find the general principle to be that "a public officer who acts without authority, or exceeds his authority, is liable * * for the act done without, or in excess of his, authority."** Lord Mansfield said in the House of Lords, concerning the Lord George Gordon riots:

* Addison on Torts, I., p. 53.
† Despan *v.* Olney, 1, Curtis.
‡ McCall *v.* McDowell,; Riggs *v.* State 3, Caldwell 85.
§ McCall *v.* McDowell; Riggs *v.* State, 3 Caldwell, 85.
‖ Riggs *v.* State.
¶ See Forsyth's Cases on Constitutional Law (British), 215.
** Richardson *v.* Crandall, 47 Barbour 335.

"Supposing a soldier, or any other military person who acted in the course of the late riots, had exceeded the power with which he was invested. I have not a single doubt that he may be punished * * upon an indictment * * * before the ermined judges sitting in Justice Hall at Old Bailey."

Nor has this doctrine been without practical illustrations. Many officers have been criminally punished, among the earliest of whom may be mentioned Captain Porteous, who was tried and condemned in Edinborough, in 1736, for having unnecessarily ordered the guards to fire upon the people. The eminent jurist, just referred to, mentions the cases of Governor Mostyn, Captain Gambier and Admiral Palisser, all of whom were held in damages for acts beyond their authority.

In the case of Rex *v.* Pinney,* Littledale, J., said: "A party entrusted with the duty of putting down a riot, whether by virtue of an office of his own seeking, or imposed upon him, is bound to hit the exact line between excess and failure of duty, and that the difficulty of doing so, though it might be some ground for a lenient consideration of his conduct on the part of the jury, was no legal defense to a charge like the present. Nor could a party so charged excuse himself on the mere ground of honest intention."

These remarks, illustrating the law in its harshest phases, are open to certain explanations and qualifications. If it be meant that the law will not generally excuse mistakes of law, because every man is bound to know that, it is no doubt sound; but in the sense that officers are to be held responsible for mistakes of fact, where their ignorance does not arise from fault or negligence, it seems to be opposed to the current of judicial decision.

The rule was indicated in the case of Sutton *v.* Johnston, as follows:

"There is a wide difference between indulging to situation a latitude touching the extent of power and touching the abuse of it. Cases may be put of situations so critical that the power ought to be unbounded, but it is impossible to state a case where it ought to be abused, and it is the felicity of those who live under a free government, that it is equally impossible to state a case where it can be abused with impunity."†

Or, as stated by Blackburn, J., in the case against Penney, before cited:

"I think the officer is bound, under such circumstances, to bring to the exercise of his duty ordinary firmness, judgment and discretion; I think he is bound to do that, and I think, in such a case, the jury have to determine upon the evidence:—First, whether the circumstances were in fact such that, what was done, really was in excess of the duty of the officer; and secondly, whether a person placed in the position of that officer, having the information that he had, believing what he did believe, and knowing what he did know, if exercising ordinary judgment, firmness and moderation, would have perceived it was an excess."

The principle that a wide discretion should be given to military officers in circumstances of danger is based upon the facts that action must be prompt and decisive, and that information is often meagre and misleading. The soldier who acts amid the noise and danger, the uncertainties and

* 3 B. and Ad. 958.
† 1 Term Rep., 401.

perplexities of the field of action, must not be judged by facts as they appear in the calm, judicial atmosphere of the forum.

To provide for the civil employment of troops, to urge them on to the fight for the public safety, and then, when danger has subsided, to take them into a court and subject them to the same rules that govern men in their daily intercourse, is a species of cruelty fortunately denounced by nearly every judge who has had occasion to pass upon the subject.

"Great latitude ought to be allowed, and they (military men)," said Lord Mansfield,* "ought not to suffer for a slip of form, if their intention appears by the evidence to have been upright. * * * The principal inquiry to be made by a Court of Justice is how the heart stood."

It was said by the Supreme Court of the United States that they knew of no case in England, or this country, where it was held otherwise than that a public officer, acting from a sense of duty, in a matter where he is required to exercise discretion, is not liable to an action for an error of judgment.†

If, then, the ordinary rules of law are inapplicable, by what rules is the soldier to be judged? What are the limits of his discretionary power beyond which he must be held liable, and within which his actions shall be deemed innocent?

The law on the subject will be found stated in the following:

"From a careful examination of authorities from the case of Turner *v.* Sterling, 23 Charles II., reported in 2 Ventris 26, down to our own times, both in the English and American courts, the doctrine that a ministerial officer, acting in a matter before him with discretionary power, or acting in a matter before him judicially, or as a *quasi* judge, is not responsible to any one receiving an injury from such act, unless the officer act maliciously and wilfully wrong, is most clearly established and maintained."‡

The question whether a military officer's duties, in time of riot, are discretionary, and therefore within the rule as above stated, is answered in the case of Donecker *v.* Solomon, as follows:§

"It is sometimes difficult to draw the line between ministerial and discretionary or judicial authority. The same officer may act sometimes in one capacity and sometimes in the other. A sheriff with an execution against the property of a particular person, acts in executing it, only as a ministerial officer, and if he takes any property to satisfy it, except that of the defendant therein named, he is liable to an action.

But the same officer, when he is authorized by law *to suppress a mob*, has more or less of discretionary authority entrusted to him. A military officer, who should be directed by the President in time of War to arrest a particular individual as a spy, would act in making the arrest merely as a ministerial officer; and if, by mistake, he arrested the wrong man, he would be liable to an action. But if his orders were general, to go with military forces into an insurrectionary district and quell the insurrectiou, *he would be clothed with authority discretionary*, and in its nature judicial."

* Wall *v.* McNamara, 1 T. R.

† Kendall *v.* Stokes, 3 Howard, 87.

‡ Reed *v.* Conway, 20 Mo., 43; see, also, Addison on Torts, I., p. 31, and cases collected there.

§ 21 Wisconsin, 620.

The case of Ruan *v.* Perry* was an action brought against the commander of a United States man-of-war, who, under general instructions, had seized a neutral vessel and taken it from its course; the vessel, when released, was, because of the detention, captured. The Court held the defendant not to be liable, because it was "not inclined to believe that the detention was unreasonable, fraudulent or collusive."

Where a particular authority is confided to a public officer to be exercised by him in his discretion upon an examination of facts, of which he is made the appropriate judge, his decision upon the facts, in the absence of any controlling provisions, is absolutely conclusive as to the existence of those facts;† his mandates to his legal agents, on his declaring the event to have happened, will protect them, and it is neither their duty or their business to investigate these facts and review his judgment. "In a military point of view, the contrary doctrines would be subversive of all discipline; and as it regards the safety and security of the United States and its citizens, the consequences would be deplorable and fatal."‡ Justice Wilson, in Drewe *v.* Coulton,‖ draws the distinction, that an officer is "answerable, in very few cases, for what he does to the best of his judgment in cases where he is compelled to act; but the action lies, where he has an option, whether he will act or not."

Where a public act or order rests in Executive discretion neither he nor his authorized agent is personally or civilly responsible for the consequences.§

Perhaps the leading case in the United States on the amenability of officers for errors of judgment and mistakes of law is that of Wilkes *v.* Dinsman, in 7th Howard. The Supreme Court, after adverting to the circumstances that the defendant was not acting in a private capacity for private purposes, but was, on the contrary, a public officer, with duties imposed upon him by the Government, which were not voluntarily sought or assumed, but discharged in the routine of an honorable and gallant profession, and under high responsibilities for neglect,—said that,

"A public officer, invested with certain discretionary power, never has been, and never should be, made answerable for any injury, when acting within the scope of his authority, and not influenced by malice, corruption or cruelty." And,

"In such a critical position his reasons for action, one way or another, are often the fruits of his own observation, and not susceptible of technical proof on his part. No review of his decision, if within his jurisdiction, is conferred by law on either courts, or juries, or subordinates; and, as this court held in another case, it sometimes happens that 'a prompt and unhesitating obedience to orders is indispensable to the complete attainment of the object,' while subordinate officers or soldiers are pausing to consider whether they ought to obey, or are scrupulously weighing the evidence of the fact upon which the Commander-in-chief exercises the right to demand

* 3 Caine's Term Rep's, 123.

† Allen *v.* Blunt, III. Story, 745; Vanderheyden *v.* Young, 11 Johnson, 174.

‡ 11 Johnson, 174.

‖ 1 East 56, notes.

§ Durand *v.* Hollins, 4 Blatchf., 454.

their services the hostile enterprise may be accomplished without the means of resistance."—12 Wheaton, 30.

Hence, while an officer acts within the limits of that discretion, the same law which gives it to him will protect him in the exercise of it. But for acts beyond his jurisdiction, or attended by circumstances of excessive severity arising from ill-will, a depraved disposition, or vindictive feeling, he can claim no exemption, and should be allowed none under color of his office, however elevated or however humble the victim.—2 Carr *v.* Paine, 158, note; 4 Taunton, 67.

When not offending under such circumstances, his justification does not rest on the general ground of vindicating a trespass in private life, and between those not acting officially and not with a discretion. Because then, acts of violence being first proved, the person using them must go forward next and show the moderation or justification of the blows used.—2 Greenleaf on Ev., Sec. 99.

The chief mistake below was in looking only to such cases as a guide. For the justification rests here on a rule of law entirely different, though well settled, and is, that the acts of a public officer on public matters, within his jurisdiction, and where he has a discretion, are to be presumed legal, till shown by others to be unjustifiable.—Gidley *v.* Palmerston, 7 Moore, 111; Vanderheyden *v.* Young, 11 John., 150; 6 Har. & Johns., 329; Martin *v.* Mott, 12 Wheaton, 31.

This, too, is not on the principle merely that innocence and doing right are to be presumed till the contrary are shown.—1 Greenleaf, Sec. 35–37. But that the officer, being intrusted with a discretion for public purposes, is not to be punished for the exercise of it, unless it is first proved against him, either that he exercised the power confided in cases without his jurisdiction, or in a manner not confided to him, as with malice, cruelty, or wilful oppression, or, in the words of Lord Mansfield in Wall *v.* McNamara, that he exercised it as "if the heart was wrong."—2 Carr & Payne, 158, note. In short, it is not enough to show he committed an error in judgment, but it must have been a wilful and malicious one.—Harman *v.* Lappenden *et al*, 1 East, 562, 565, note.

It may not be without some benefit, in a case of so much interest as this, to refer a moment further to one or two particular precedents in England and this country, and even in this court, in illustration of the soundness of these positions.

Thus, in Drewe *v.* Coulton, 1 East, 562, note, which was an action against the defendant, who was a public returning officer, for refusing a vote, Wilson, J., says: "This is, in the nature of it, an action for misbehavior by a public officer in his duty. Now, I think it cannot be called misbehavior unless maliciously and wilfully done, and that the action will not lie *for a mistake in law*. By wilful, I understand contrary to a man's own conviction."

* * * * *

In a case in this country, Jenkins *v.* Waldron, 11 Johns., 121, Spencer, J., says, for the whole court, on a state of facts much like the case in East: "It would, in our opinion, be opposed to all the principles of law, justice and

sound policy, to hold that officers called upon to exercise their deliberate judgments are answerable *for a mistake in law*, either civilly or criminally, when their motives are pure and untainted with fraud or malice."

It becomes important to determine the distinction between duties ministerial and duties discretionary.

Ministerial duty has been defined to be a duty "in respect to which nothing is left to discretion. It is simply definite duty, arising under conditions admitted or proved to exist, and imposed by law."* The Court, in a case in 1 Woolworth,† quotes, with approval, the foregoing definition, and illustrates by naming "a manual delivery of a commission as Justice of the Peace," and the "allowance of a credit of a definite sum on account of relator with the Treasury." Ministerial offices are those which give the officer no power to judge of the matter to be done, and which require him to obey some superior, many of which are merely employments requiring neither a commission nor a warrant of appointment, as temporary clerks or messengers."‡ It must be absolute, certain and imperative.§

On the other hand, discretion means, "when applied to public functionaries, a power or right conferred upon them by law, of acting officially in certain circumstances, according to the dictates of their own judgment and conscience, uncontrolled by the judgment or conscience of another."‖ These quotations serve to make it more apparent, that military officers, when in the field in pursuance of their duty, are vested with discretionary powers, and are to be dealt with accordingly, if by mistake of law or error of judgment, their action may be subsequently inquired into before a court of justice.

It may be added that, while the rule is as already stated, that it is only malice or corruption that will render an officer liable for actions done within the scope of his authority, there are cases that go still further, and hold that, where powers are discretionary, the officer "is exempt from all responsibility, by action, for the motives which influence him, and the manner in which such duties are performed. If corrupt he may be *impeached* or *indicted*, but the law will not tolerate an action to redress the *individual* wrong which he may have done,"¶ "however malicious the motive."**

If, then, malice begets liability, it is well to inquire what malice is. The words, maliciously, corruptly and wilfully, are used interchangeably in this relation.

"Wilfully, in the ordinary sense in which it is used in statutes, means not merely voluntarily, but with a bad purpose."*† "It is frequently understood as signifying an evil intent without justifiable excuse."*‡ "By wilful, I understand contrary to a man's own conviction."*§

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* Miss. *v.* Johnson, 4 Wall, 498.
† (U. S. C. C.) 309.
‡ Fitzpatrick *v.* U. S., 7 Ct. Claims, 293.
§ Wilson *v.* Mayor, 1 Denio, 599.
‖ Judges *v.* People, 18 Wend (N. Y.) 99.
¶ Wilson *v.* Mayor, 1 Denio 599.
** 3 Denio 120.
*† Com. *v.* Kneeland, 20 Pick (Mass.), 220.
*‡ Felton *v.* U. S. 6 Otto, 702.
*§ Drewe *v.* Coulton, 1 East 562.

Malice is "the doing of a wrongful act intentionally without just cause or excuse;"* with a wicked and mischievous purpose;† is the conscious violation of a law to the prejudice of another.‡ The term "extends to an evil design, a corrupt and wicked notion against some one. * * * Malice is a wicked, vindictive temper, regardless of social duty and bent on mischief."§ Among us, malice is a term of law importing, directly, wickedness, and excluding a just cause or excuse."‖

Cruel and barbarous treatment, oppression or undue harshness, render officers liable to damages, and it is the duty of the superior to inquire into the situation and superintend the course of his subordinates.¶ But the superior will not be responsible for the unauthorized acts of the inferior,** where, as in the Government service, there is community of service; for instance, the Postmaster-General is not liable for the acts of his inferior;*† nor is the Government responsible for the torts or wrongs of its agents.*†

IV. FIRING UPON THE MOB.

The most important and most serious question arising before the military officer for solution, during riot duty, is how far the law will sustain him and permit him to go, in ordering his command to fire upon the riotous multitude.

It may be accepted as unquestioned, that where it is necessary to prevent the perpetration of a felony, or to arrest a felonious culprit, he may use force to any extent; this, indeed, is the right of any citizen. The general rule that homicide is justifiable only under these circumstances, and not in case of misdemeanor, does not apply to riotous misdemeanor.*† "*Unless it be in case of riots,* it is not lawful for an officer to kill a party accused of misdemeanor, if he fly from arrest, though he cannot be otherwise overtaken."*§

The rule that felony alone justifies slaying is further modified by the rule that those present at the commission of a riotous felony are principals;*‖ they may *primâ facie* be inferred to be participants, and the obligation is cast upon a person so circumstanced in his defense to prove his actual non-interference;*¶ and this is eminently so, where the proper officer has commanded the dispersion of the assembly.

"The difference between a riot and an unlawful assembly is this: if the parties assemble in a tumultuous manner, and actually execute their purpose with violence, it is a riot; but if they merely meet upon a purpose, which, if executed, would make them rioters, and having done nothing,

* 4 B. & C. 255.
† 9 Metc. 104.
‡ 9 Cl. & F. 32.
§ Bouvier's Law Dict'y; Foster's Crown Law, quoted in Finlason's Martial Law, p. 28, n.
‖ Russel on Crimes, I., p. 667, n.
¶ Dinsman *v.* Weekes, 12 Howard 405; McCall *v.* McDowell, 1 Abbott 212.
** Nicholson *v.* Mounsey, 15 East 384.
*† Story, § 319, § 322.
*‡ Wharton on Homicide, § 213.
*§ Wharton's Criminal Law, 9th Ed., § 404.
*‖ Reg. *v.* Howell; 9 Car. & P. 437; Reg. *v.* Simpson, 1 Car. & M. 669; 4 Pa. Law J. 29.
*¶ Wharton's Crim. L., § 1542.

they separate without carrying their purpose into effect, it is an unlawful assembly."* Nor is it a necessary element of unlawful assembly or riot that the object desired be unlawful;† the object may be lawful, but the meeting may be held under such circumstances of place and time, or the object to be sought in such a violent and turbulent manner, to the terror of the people, as to constitute the offense. For instance, the proposed marching of fifteen thousand people to present a petition at the time of the Chartist demonstration in England in 1848, was declared by the Government to be criminal and unlawful, since it would be an assemblage of large numbers, accompanied with circumstances tending to excite terror and alarm; and so if a lawful meeting adjourn to march in a body to a place, principally inhabited by those notoriously opposed to its objects, and openly exhibit arms and display banners containing inscriptions lacerating to the feelings of such citizens, such an assembly sinks into a riot.‡

As to the right of interference of the magistrate, or those acting under him, or by his authority, it seems beyond the possibility of doubt or denial, that the moment an assembly becomes unlawful, the right exists.

"It is evidently of the highest importance to the public peace to have it recognized and established that interference need not wait for any actual outbreak or movement of the assembly sufficient to constitute an actual rout or riot." * * * "Whatever force is necessary to accomplish the object of dispersing the unlawful assembly, may and ought to be used." * * * "After warning to depart, and especially after the efforts of the magistrates to disperse the assembly by less violent measures have been frustrated, all who remain are guilty of participation, and the consequences are upon their own heads. The death of any such, either by the public authorities, or those who act in their assistance and under their orders, would be justifiable homicide."§

The principle that an unlawful assembly may be dispersed by the magistrate, when he finds interference necessary in preserving the public peace, is also stated by Wharton,‖ who adds that action need not be delayed until riot has ripened; that it is better to anticipate more dangerous results, by energetic intervention at the inception of the threatened breach of the peace.

He continues: "When, however, as was laid down by Lord Loughborough, in the Lord George Gordon riots, and as has been held in this country in riots of similar types, an unlawful assembly assumes more dangerous form and becomes an actual riot, particularly where life or property are threatened by the rioters, measures more decisive should be adopted. Citizens may, of their own authority, lawfully endeavor to suppress the riot, and for that purpose may even arm themselves, and whatever is honestly done by them in the execution of that object, will be supported and justified by common law."

Judge King, in his charge, at the time of the Philadelphia riots, said:

* Russel on Crimes, I, 387.
† Russel on Crimes, I, 381, and cases cited; 4 Pa. Law J. 35.
‡ 4, Pa. Law Journal, 35.
§ Western Law J., Vol. II., 55.
‖ Crim. Law, 9th Ed., §1535.

"If they resist the sheriff and his assistants in their endeavor to apprehend them, and continue their riotous actions, under such circumstances the killing becomes justified."

The fact that citizens may justifiably commit homicide in suppressing riots, although a riot is not necessarily felonious, is due to the nature of the offense, which requires the combination of a number of persons, assembling together and actually accomplishing some object, calculated to terrify others.*

"It may be premised generally that where persons have authority to arrest or imprison, or otherwise execute the public justice of the Commonwealth, and using the proper means for that purpose, are resisted in so doing, and the party resisting is killed in the struggle, such homicide is justifiable."†

And again, we find the law as stated by the same author to be as follows:

"As has been already observed, if officers of the law, when engaged in the preservation of the peace, find it necessary to take life, such homicide is justifiable. The rule is not confined to the instant the officer is on the spot * * for he is under the same protection going to, remaining at, or returning from the same. * * It follows from this, that if such an officer successfully resists those who seek to obstruct and hinder him from proceeding to the lawful execution of his duty in such respect, he is justified even should the lives of the assailants, their aiders and abettors, be taken from the necessary extent of the resistance so made."‡

The rule is explicitly stated in the Regulations of the National Guard of New York.§

"By the laws ot the land, homicide or the taking of human life is justifiable, when necessarily committed by public officers, and those acting under their command, in their aid and assistance in overcoming resistance to the execution of legal process, or to the discharge of any other legal duty."

The principles of law, as they have been recorded in the preceding pages, have, in a number of the States, been enacted into Statutes; as, for instance, in Connecticut we find the following provision in the State Military Code:¶ "If any person or persons resisting the laws of the State, or unlawfully or riotously assembled, shall be injured or killed by any of the military force called out under the provisions of this act, such force shall be discharged from all civil or criminal liability therefore."

New York, Massachusetts, Wisconsin, etc., have similar enactments.

In operations against rioters, as in the campaign of more extended warfare, it becomes necessary, often, to convert private property to public use, or to sieze or destroy it, to prevent it from falling into the enemy's hands.

Where the danger is immediate and impending, or the necessity urgent, such as will not admit of delay, aud where the civil authority would be too late in providing the means called for, private property may be taken by a

* Pond *v.* People, 8 Mich., 178; Wharton Crim. L., §490.
† Wharton Crim., Pleading and Prac., §17, n.
‡ Crim. Law, §407.
§ Par. 495.
¶ Chap. CXXXIX, Sec. 4.

military commander.* The existence of such a necessity is a question for the jury, and must be clearly established by the party who alleges, is the doctrine of Holmes *v.* Sheridan ;† this view is regarded as erroneous, being opposed to the weight of opinion, which holds, as previously elucidated, that the act of a military commander, within the line of his duty, is liable only in the case of its being malicious or corrupt. And the proposition of the Court in Mitchell *v.* Harmony, that: "The officer who made the seizure cannot justify his trespass by showing the orders of his superior officer. * * An order to commit a trespass can afford no jurisdiction to the person by whom it was executed,"—is open to the explanation, that the subordinate can be held liable, only where the order is plainly, and to the commonest understanding, illegal.

The Government, not the officer, is responsible for the property taken for public use.‡ And a subsequent ratification of the act by the Government is equivalent to prior authority to do it.§

It is a general rule of public policy that persons in the public service shall be exempt from arrest upon civil process, while in the performance of their duties, and is therefore, applicable to military officers.‖

By Sec. 1237, R. S., enlisted men are exempted from arrest on civil process, except for certain enumerated debts. On the other hand, the exemption does not extend to criminal process, in time of Peace. ¶

One State of the Union, in times of insurrection, has no authority to give orders to her troops to pass over the line into the other State; such orders would not shield officers or soldiers from criminal responsibility. **

* Mitchell *v.* Harmony, 13, Howard, 115; Bryan *v.* Walker, 64 N. C., 141; Koonce *v.* Davis 7 N. C., 220.

† 1, Dillon, 351.

‡ Drehman *v.* Stifel, 41 mo., 185; 1 Dillon, 351.

§ B—— *v.* Denman, 2 Exch., 189.

‖ U. S. *v.* Kirby, 7 Wallace, 483; Coxson *v.* Doland, 2 Daly, 68.

¶ See Authorities on last note, and Article 59.

** Commonwealth *v.* Blodgett, 55 Mass.

CHAPTER III.

MARTIAL LAW.

I. WHEN IT IS JUSTIFIED.

WE have seen that disorders may be met under the general supervision of the Civil Power, first by local Peace officers, then by the Militia; and, as a further step, by invocation of the Federal arms, and, in case of more serious insurrection, by these forces, aided by the Militia of other States; but a condition of offences, still more grave, of which the past bears record and the future threatens recurrences, may arise, in which civil authority may be powerless—then it is that the Military Power interposes to prevent anarchy—and by the exercise of summary methods, endeavors to restore the disturbed district to that condition which shall permit civil courts and functionaries again to administer justice.

The rule of the military under such circumstances is termed Martial Law in England and the United States, and is analagous to the "state of siege" of the continental jurists, differing from the latter, however, in that we are without positive law on the subject, while, on the Continent, it is regulated by statute.

Indeed the views of Sir Matthew Hale that "Martial law is no law at all, but something indulged rather than allowed by law"; and that of the Duke of Wellington that it is no more or less than the will of the commanding officer—are with us measurably accurate definitions to-day; it is to be observed, however, that time has resolved many uncertainties, and established many principles.

Fortunately, in our own history and in that of Great Britain, the declaration of martial law has been of the rarest occurence.

To this fact are to be attributed the ignorance concerning this important subject, and the perplexities and uncertainties in which it is shrouded. Lord Loughborough said that martial law "has long been exploded"; * Blackstone says that in its true sense, "it has no place in the institutions of this country."

The Petition of Right abolished it in time of Peace. And there are few who will question the soundness of the views of the jurists quoted, or the constitutional morality of the Petition of Right in this respect.

* Nen. Blackst. 69.

Martial law, as a matter of convenience, has no place in the institutions of any free country; but martial law, as a matter of necessity, rests upon another basis. *In time of Peace* the methods of Peace must prevail; but in time of Insurrection or War, the methods of Peace cannot prevail. Mr. Hallam, in his Constitutional History of England, says:*

"There may, in times of pressing danger, when the safety of all demands the sacrifice of the legal rights of the few—there may be circumstances that not only justify, but compel the temporary abandonment of constitutional forms. It has been usual for all Governments, during an actual rebellion, to proclaim martial law, or the suspension of civil jurisdiction.

Concerning martial law in England, we are informed by Lord Chief Justice Cockburn† that no such thing has ever been put in force in that country against civilians for the purpose of putting down rebellion.

The military was employed, but the situation did not become sufficiently grave to call for martial law in 1715, again in 1745, and in 1780. In Ireland, however, it has been declared and put in force, with all its rigors, on three separate occasions—1798, 1803, and 1833. It has also been enforced in several of the colonies, notably in Jamaica, in 1867. It is stated that the right to declare martial law adheres to the Crown.‡ Nor is this statement thought to be opposed to the judgment pronounced by Lord Cockburn in the case cited above, that the Crown has no authority to inforce martial law in any part of the realm, *where the laws of England prevail*—the correct view of martial law being, that it is compatible with a state of war, rebellion, or insurrection only. The same learned authority admits that Parliament, by virtue of its unlimited power, may call it into operation.§

In the United States the subject is enveloped in uncertainty; the Constitution is silent, there are no statutes and but few decisions of courts. The latter, while far from possessing the accuracy of a navigator's chart, serve to point out the principal rocks and headlands, and thus, in a measure, to indicate the course to be sailed by mapping the dangers to be avoided.

The Constitution being silent upon the subject of martial law, it becomes important to ascertain whether any of its provisions contemplate, by implication, such a measure.

The minority opinion in the Milligan case‖ states that the authority of military commissions, acting under martial law, to punish for offenses against the security and safety of the national forces, may be derived from Congress, under the Constitutional power of the latter, "to raise and support armies and to declare war," if not from its constitutional authority "to provide for governing the national forces."

Again it has been asserted that martial law, being simply military authority exercised according to the laws and usages of war, inheres to the law of nations, and is included in the authority of Congress to define and

* I, 240.
† Charge in Rex v. Eyre.
‡ Fenlason, Martial Law, 45 and 74.
§ Johnson's Ency., "Martial Law."
‖ 4 Wall, 118.

punish offenses against the law of nations.* On the other hand we find that people are to be secured in their persons, houses, papers and effects, against unreasonable searches and seizures; that no person shall be deprived of his life, liberty or property, without due process of law; nor shall private property be taken for public use without just compensation; that the right of trial by jury, and others equally important, are not to be denied. Whatever, then, may be the rule as to martial law in time of War or insurrection, it seems clear that in time of Peace it can have no place in the institutions of this country. "The people have never delegated to any department of the Government, or to any officer, civil or military, the authority to subvert the laws or put aside the Constitution, either temporarily or permanently."†

Where the civil authority exists the Constitution is imperative that it shall be paramount to the military;‡ where the courts, in the midst of loyal communities, are in the *undisturbed* exercise of their ordinary jurisdiction, martial law cannot exist.§

The same opinion was expressed by both the majority and minority of the Supreme Court in the Milligan case.

The majority said that "martial rule can never exist when the courts are open and in the proper and unobstructed exercise of their jurisdiction. It is also confined to the locality of a actual war." In this view the minority concurred in the following words: "We by no means assert that Congress can establish and apply the laws of war where no war has been declared or exists. Where Peace exists the laws of Peace must prevail." The rock upon which the court split was the power of Congress, or any authority, to declare martial law in a district removed from the seat of actual hostilities. The majority denied the existence of the right; the minority asserted it. One viewed martial rule as being justified only by necessity; the other as being a matter of expediency. It will be remembered that Milligan had been tried and condemned by a military commismission acting under martial law in Indianna. The opinion of the majority of the court says: "It will be borne in mind that his is not a question of the power to proclaim martial law when war exists in a community, and the civil authorities are overthrown. * * It follows from what has been said on this subject, that there are occasions when martial rule can be properly applied. If, in foreign invasion or civil war, the courts are actually closed, and it is impossible to administer criminal justice according to law, then on the theatre of active military operations, where war really prevails, there is a necessity to furnish a substitute for the civil authorities thus overthrown to preserve the safety of the Army and society; and as no power is left but the military, it is allowed to govern by martial rule until the laws can have their free course. As the necessity creates the rule, so it limits its duration. * * Martial law cannot arise from a threatened invasion.

* Col. Scott, Journal Mil. S. I., IV., No. 16.

† Cooley's Story, note, p. 99; Pomeroy's Const. Law, p. 476; Prof. Joel Parker on Martial Law, 37.

‡ Griffin *v.* Wilcox.

§ Johnson *v.* Jones, 44 Illinois, 143.

The necessity must be actual and present; the invasion real, such as effectually closes the courts and deposes the civil administration."

On the other hand, the minority said:

"What we do maintain is, that when the nation is involved in war, and some portions of the country are invaded, and all are exposed to invasion, it is within the power of Congress to determine in what States or district such great and imminent public danger exists as justifies the authorization of military tribunals for the trial of crimes and offenses against the discipline or security of the Army or against the public safety." "Martial law proper * * is called into action by Congress, or temporarily, when the action of Congress cannot be invited, and in the case of justifying or excusing peril by the President in times of insurrection or invasion, or of civil or foreign war, within districts or localities where ordinary law no longer adequately secures public safety and private rights."

Of the two views here presented, it is believed that the one expressed by the majority of the court, and which stands, therefore, as its decision, represents the correct view of martial law in a free and constitutional country.

It would seem destructive of the foundations of liberty and personal security that martial rule, with its summary procedure, should be invoked in the place of excusing peril.

Such a rule employed by a tyrant, or against an unpopular cause, would appear to demonstrate that, in real worth, our vaunted Constitution is valueless; since it is in times of disturbance that our liberties are most threatened, and should be most highly guarded. That no circumstance, this side of absolute necessity, should be deemed sufficient to set aside the Constitution, appears to be a principle established alike by reason and by the weight of authority.

Kent tells us that it is founded on paramount necessity.* Mr. Clode, in his learned work on the Military Forces of the Crown,† expresses the following views: "The only principle on which the law of England tolerates what is called martial law, is necessity; its introduction can be justified only by necessity; its continuance requires precisely the same justification of necessity; and if it survives the necessity on which alone it rests for a single minute, it becomes instantly a mere exercise of lawless violence. When foreign invasion or civil war renders it impossible for courts of law to sit, or to enforce the execution of their judgments, it becomes necessary to find some rude substitute for them, and to employ for that purpose the military, which is the only remaining force in the community. While the laws are silenced by the noise of arms, the rulers of the armed force must furnish, as equitably as they can, those crimes which threaten their own safety and that of society; but no longer: every moment beyond is usurpation: as soon as the law can act every other mode of punishing supposed crimes is itself an enormous crime."

Lord Brougham said that martial law is "created by necessity, and

* I, 377, n.
† II, 161.

necessity must limit its continuance."* In this connection reference may be made, appropriately, to an opinion of the Supreme Court, in 1865, deciding that martial law, which had been declared in Baltimore early in the War and never rescinded, had ceased to exist when the necessity for its existence ceased.

Sir Matthew Hale said that martial law is indulged; but "all authorities agree that it can be indulged only in case of necessity, and that when the necessity ceases, martial law ceases."†

Or, in the language of Attorney-General Cushing:‡ "When martial law is proclaimed under circumstances of assumed necessity, the proclamation must be regarded as the statement of an existing fact, rather than the legal creation of that fact."

"The right conclusion upon the whole matter seems to be this: Martial law may be justifiably imposed as a terrible necessity, and an act of self-defense."§

But it may be urged that the view that martial law may be invoked "in times of insurrection, or invasion, or of civil or foreign war, within districts or localities where ordinary law no longer adequately secures public safety and private right;" and the rule that it may be declared only when "no power is left but the military," would practically amount to the same thing, since the justifying occasion must rest within the discretion of some authority capable of establishing it.

But upon examination, it is thought, there will be found to be a line of limitation, sufficiently distinct. For example, following the minority view, we find that to enforce martial law in any part of the country it is only necessary that, within the judgment of Congress or the President, during the existence of war in some portions of the country, the danger should be sufficiently great and imminent, or that ordinary law no longer adequately secures public safety and private rights. On the other hand, under the Court's decision, the severities of martial law may be imposed only on the theatre of active military operations,‖ where war really prevails, when the courts are actually closed, when it is impossible to administer criminal justice, when the civil authority is practically overthrown and no power is left but the military; the necessity must be actual and present; the invasion real, such as effectually closes the courts and deposes civil administration; and the necessity which creates the rule must limit its duration.

An important question arises at this point, which is of special application to the subject in hand. Having seen that all opinions agree that war must exist, to justify martial rule, it is necessary to determine what is meant by war—whether serious rioting may be brought under that head. It is evident that the condition of war, which may be instituted by Congress alone, is not alone referred to, since we have seen that authorities agree

* Clode, M. F. C., II., 161.

† Quoted, *in re* Egan, 5 Blatch, 320.

‡ 8 Op. Att'y Gen. 365.

§ Forsyth's Cases on Const. Law, 214; see also opinion of Attorney and Solicitor-Generals, same, 199.

‖ 7 How. 83; 3 Mart. La., 530; 6 Am. Arch., 186; 2 H. Blacks, 165; I. Term, 549; 1 Knapp, P. C. 316; 13 How, 115; 1 Hill, n. 9, 377; 25 Wendell, 483, 512, n.

that insurrection, invasion and rebellion are justifying events, and, under the Constitution, the power to deal with them might be delegated to the President by Congress (which has been done).

Armed opposition to the law, and insurrection (embracing its largest proportions) and invasion are treated by the Constitution as totally distinct from the question of war.* General Order No. 100 (A.-G. O., 1863) † defines insurrection to be "the rising of the people in arms against their Government or a portion of it, or against one or more of its laws, or against an officer or officers of the Government. It may be confined to mere armed resistance, or it may have greater ends in view." Lord Coke distinguishes as follows: "When the courts of justice be open and the judges and ministers of the same may by law protect men from wrong and violence, and distribute justice to all, it is said to be time of peace. So when by invasion, insurrection, rebellion or such like, the peaceable course of justice is disturbed and stopped, so as the courts be, as it were, shut up, *et silent inter leges arma*, then it is said to be time of war." ‡

Those who make an insurrection in order to redress a public grievance, whether real or pretended, and attempt by force to redress it, are held, in England, to levy war against the Sovereign; although they have no direct design against him—and this is so because they attempt to do by private authority, which ought to be done by public justice—"as, where great numbers attempted by force to revenge themselves against a magistrate for executing his office." § Several instances are quoted in Finlason on martial law of the prosecution of rioters for levying war. ‖ There must be overt acts; ¶ seditious language alone would not justify martial law; ** but the resistance need not necessarily be armed.**

"Armed or unarmed resistance by citizens of the United States against the lawful movements of their troops is levying war against the United States, and is therefore treason," is the language of General Order No. 100.

Therefore, in view of these authorities, it would seem to be as safe deduction that riot, in its more serious aspects, is within the definition of insurrection or war, and therefore justifies the recognition of martial law.

What is meant by the expression running through the decisions quoted, that martial law may exist only when the *courts are closed?*

It includes not only those cases where the Court cannot sit, but those where its process cannot be enforced, although, technically, the Court may be able to hold its sessions.

"'Where it is impossible,' said the late Sir James Mackintosh, 'for courts of law to sit or to inforce the execution of their judgments, then it becomes necessary to find some rude substitute for them, and to employ for that purpose the military, which is the only remaining force in the community.'" *† Martial law cannot exist where the civil courts are in the

* Johnson *v.* Jones, 44 Illinois, 142.
† Article 149.
‡ Quoted in Griffin *v.* Wilcox.
§ Hawkins Pl. Cr. I., chap. 65, s. 6; chap. 17, s. 2.
‖ 12, note (a).
¶ Whiting, War Powers, 293.
** Finlason.
*† Clode, Mil. and Martial Law, 166.

midst of loyal communities, and in the undisturbed exercise of their ordinary jurisdiction.* Civil tribunals must be practically superseded†; effectually closed‡; broken up or dispersed, or disabled through the prevalence of disorder and anarchy from exercising their functions.§

Courts are not open, when, it mattering not whether they are really open or not, if law cannot, so far as the insurrection is concerned, have its course, either because of great numbers of offenders, or their great power, their ability to resist arrest by ordinary civil process, the difficulty of identifying and charging actors in particular outrages, and proving specific charges against them; many outrages may be committed, and it may be impossible to arrest or identify one offender, and this is so where a rebellion is widespread—in such cases it would be idle to say that the courts are open.‖ "The courts are not necessarily closed, for all actions relating merely to the private affairs of individuals may still be entertained without detriment to the public service; but it closes the consideration there of any action, suit, or proceeding in which the civil process would impair the efficiency of the military force."¶ In the Instructions for Armies in the Field,** it is direct that:—"All civil and penal law shall continue to take its usual course in the enemy's places and territories under martial law, unless interrupted or stopped by order of the occupying power"—such a rule is thought to embody the best procedure under domestic martial law.*† In 1798 and 1803, martial law was enacted for Ireland, and was to be inforced, whether the civil courts were open or not; but the subject was not to be deprived in civil cases of the ordinary course of law.*‡

II. WHO MAY DECLARE IT.

Another question of a practical nature suggests itself; who may declare or announce the existence of martial law?

We have seen that the minority opinion in the Milligan case names Congress, or, in an emergency, the President, as possessing the power. It is not important to determine whether Congress possesses the right or not, since it would seldom, probably never, exercise it. It may be said, however, that on the theory that martial law is recognized, not established, by proclamation, it would seem clear that the authority rests more properly with the Executive and his representatives.

It has been exercised in this country by the President, and by general officers commanding departments, or in the field, but Congress has never declared martial law, and Rhode Island presents the only instance where a State Legislature has done so. It was declared at New Orleans, by the Department Commander, on the occasion of the riots, July 30, 1866; by Captain

* Johnson *v.* Jones, 44 Ill., 143.
† Forsyth, 199.
‡ Milligan case.
§ *In re* Egan, 5 Blatchf., 320.
‖ Finlason, Martial L., 4.
¶ Joel Parker, Martial Law, 38.
** G. O. No. 100, A. G. O., 1863.
*† Finlason, 43.
*‡ Digest Op. J. A. Gen'l, 315.

Kline, at the time of the Chattanooga floods, 1867;* and was authorized by Governor Wright, of Indiana, at the time of an alleged rebellion in Clay Co.†

The Court in the case just cited, admits the right, temporarily and locally, of the President and Governor to proclaim martial law; and states that the power is usually exerted through subordinate military officers.‡

"The war power of the President, then, may be stated thus: He has a right to govern through his military officers, by martial law, when and where the civil power of the United States is suspended by force. In all other times and places, the civil excludes martial law."§ The late Colonel Scott in an article on Martial Law,‖ says that it would be unfortunate if the power to invoke martial law were left to the legislature or to any disputative assembly on account of the fatal delays that might ensue; that on the theory that the declaration of martial law is only the publication of an existing fact, it would seem reasonable that the publication should pertain to the one first cognizant of the fact; that, therefore, the suspension of civil authority over an extended area would more properly be proclaimed by the Executive, and within the sphere of active military operations by the military commander, either with or without delegation of authority from the Executive.

On the latter point, Mr. Whiting says,¶ that an authority that cannot be delegated is comparatively useless; that since the executive cannot be omnipresent, it has been the uniform practice of the Government, from the beginning, that martial law and nearly all of the war powers have been exercised through officers acting under the Commander-in-chief. And in this connection may be mentioned the decision in the case of the U. S. *v.* Probasco,** that when the President has declared a State or part thereof to be in insurrection, the courts must hold that this condition continues until he declares the contrary.

An objection to the view that the President and those acting under his authority, may declare or proclaim martial law, is found in the correlative statements that the President cannot suspend the privileges of the writ of *habeas corpus*,*† and that, if such be the case, he cannot proclaim martial law, of which the suspension of the writ, is one of the least important consequences.*‡

On the other hand, it is to be said that such a view proceeds on the supposition that martial law is a measure of expediency resting within the discretion of the Legislature, and not a matter of necessity following in the wake of war, and consequent upon the shipwreck of ordinary civil authority. That the latter presents the correct views there is believed to be no doubt.

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* Winthrop Mil. Law, II., 52.

† Griffin *v.* Wilcox.

‡ See also, Ex parte Field, 5 Blatchf. cc. Repts.; and Digest, J. A. G., 315.

§ Griffin *v.* Wilcox.

‖ Journal Mil S. Inst'n., Vol. 4, No. 16.

¶ War Powers, 307.

** 11 Law Reports, 419.

*† Cases collected in Johnson's Encyclopedia, "Habeas Corpus."

*‡ Col. Scott, Vol. IV., No. 16, Jour. M. S., I.; American Law Reg., Vol. IX., 507; Johnson *v.* Duncan, 3 Martin, 531.

The leading American writer on *habeas corpus* says:* "While it is unquestionably true that where martial law exists, the privilege of the writs of *habeas corpus* is suspended. Yet whether martial law shall prevail or not does not depend upon the will of the President. Martial law comes with war, exists under proclamation or other act, and is limited by the necessities of war." "It suspends the writ because the courts are closed;" the civil functionaries are deprived of the power to serve process; it suspends everything, which is not within the scope of the President's power, under the Constitution. No provision of the Constitution, he says, is necessary to authorize the suspension of the writ in war,—the Constitution applies to cases where civil authority exists. "The doctrine seems to be that the suspension of the privilege of the writ contemplated by the Constitution has no relation to a state of martial law, and can take effect only in those cases of rebellion or invasion where the power to issue and proceed under the writ, is free and unobstructed."†

The Constitutional provision that the right of trial by jury shall not be denied, would appear to be an objection as strong against the proclamation of martial law, as the view considered. The fallacy in both cases would be that Peace and the existence of civil authority, and the possibility of ordinary remedies, are assumed to be compatible with the existence of martial law

III. DECLARATION BY STATE AUTHORITIES.

Another question of great importance is, whether a State may likewise proclaim martial law within its borders.

The right of a State under the Constitution and the laws to maintain and in proper cases, to use troops, would appear to demonstrate that in a case of serious opposition to constitutional authority, where anarchy has usurped the place of order, martial law might be employed, or more properly, would necessarily be employed to restore Peace.

There is, fortunately, an authoritative decision on this point, delivered by the Supreme Court of the United States. In the case of Luther *v.* Borden,‡ arising out of the Dorr Rebellion in Rhode Island, the legality of the proclamation of martial law was brought directly in question before the Court whose decision was, "If the government of Rhode Island deemed the armed opposition * * so formidable * * as to require * * the declaration of martial law, we see no ground upon which this Court can question its authority."

In this instance, the Legislature had made the proclamation, and the Court sanctioned its act, without having had the question of the right of the Governor or his subordinates to institute a state of martial law, brought before it. The latter point, then, must rest upon the analogies of the case; and therefore, in accordance with the view presented in these pages as to the authority of the President and his subordinates, it would seem that the right appertains to the Governor and his military subordinates.

* Hurd on *Habeas Corpus*, note, p. 127.

† Taine, p. 127.

‡ 1, 7 Howard 1.

"That in times of urgent peril, the United States or any of the States, each in its appropriate sphere of sovereignty, may seek safety in a suspension, wholly or in part of civil jurisdiction, and in the exercise of all the rigors of martial law, is at this period of our history, hardly a matter of serious controversy."*

Where a State has invoked the aid of the forces of the United States, the following principles would appear to obtain, *i. e.*, that the Governor or the Legislature, in obtaining aid from the Federal Government, escaped none of the responsibilities, and therefore loses none of the authority of their offices; that, upon declaration, martial law would remain in force until declared unlawful, or until suspended by competent State authority; that the Federal troops would co-operate with the State forces after the establishment of martial law as well as before, governing themselves by the same rules in both cases, since the order for Federal troops to co-operate involves the recognition of all measures not palpably unlawful that the Governor might deem necessary to the end in view.† The civil and criminal responsibilities of State and Federal troops would be identical, since the latter are present not unlawfully and by their own motion, but lawfully, under the provisions of the Constitution. In a like manner State troops would act, where properly called, under martial law proclaimed by Federal authority.

But it is to be observed that the scope of martial rule declared by either of the two sovereignties, State or Federal, is determined by the general principles that limit their respective jurisdictions.

IV. DEFINED.

Martial law is simply the military authority exercised in accordance with the laws and usages of war;‡ it is a terrible necessity, an act of self-defense; under it there is a suspension of civil rights, and the ordinary forms of trial are in abeyance;§ it is an assumption by military officers of absolute power, exercised by military force, for the suppression of an insurrection and the restoration of order and lawful authority;‖ it is the suspension of all law but the will of the military commanders entrusted with its execution, to be exercised according to their judgment, the exigencies of the moment, and the usages of the Service, with no fixed or settled rules of law, no definite practice, and not bound even by the rules of the military law;¶ it is only a more regular and convenient mode of exercising the right to kill in war—a right originating in self-defense, and limited to those cases where such killing is necessary as the means of insuring that end—it is justified only where it is an act of mercy, thus the matter stands by the law of nations;** it establishes a state of things in which

* Journal Mil. S. Inst., Vol. IV., No. 16.

† Col. Scott in Vol. IV, No. 16, Jour. M. S. I.

‡ G. O. No. 100, A. G. O., 1863.

§ Forsyth (Br.) 214.

‖ Opinion of Att'y and Solicitor Gen'ls, 1866 (Forsyth); Stephen's History Crim. Law, 215.

¶ Pomeroy's Constitutional Law, 477.

** Clode, Mil. Forces of the Crown, II., 161.

there is no law, but the will of the commanding officer,* suspending not only municipal law but ordinary military law;† it overrides and suppresses existing civil laws, civil officers and civil authorties, by the arbitrary exercises of military power—and every citizen or subject, in other words, the entire population of the country within the confines of its power, is subject to the mere will or caprice of the commander, who holds the lives, liberty, and property of all in the palm of his hand—being regulated by no known or established system or code of laws, being over and above them all—the commander is the legislator, judge and executioner.‡

The common law is defective in that it assumed that there is at its disposal a force adequate to the enforcement of the public peace and security, while it may happen that opposition will overwhelm the civil power with the aid even of the military, acting under its direction. Then it is that more drastic measures, the terrible severities of martial law, are necessary to the restoration of peace and order.

Martial law is an evil, but it is simply the bitter medicine that effects the cure; it is not desirable, but a law-abiding community will cheerfully submit to its brief severities rather than endure the horrors of prolonged, and, perhaps, triumphant anarchy. And so far as the insurgents are concerned, having refused to submit to law, and having adopted the method of force, it is logical to treat them in the same manner—they have placed themselves outside of the law. "The people of the United States have founded a Government to secure the 'general welfare' by preventing enemies, foreign and domestic, from destroying the country. They did not frame a Constitution so as to paralyze the power of self-defense. They have not forged weapons for their adversaries. §

The safeguards of martial law are not found in the denial of its protection, but of the amenability of the President to impeachment, of military officers to the civil and criminal law, and to military law, in the frequent change of public officers, in the dependence of the army upon the pleasure of Congress and in the good sense of the troops.‖

Martial law must mean that measures are to be considered lawful that in ordinary times are unlawful, since if severe measures could be taken and the actors liable to the same legal consequences as under common law, what would martial law mean?

While it is so that many extraordinary acts become legal, it is not to be understood that martial law, or the will of the commander, is above all law; it is absolute but not arbitrary.¶ The common law, which regulates all authorities and prevents any usurpation of power, will hold all those responsible for acts done under color of martial law, who act without proper authority or beyond the scope of their jurisdiction. But within proper bounds, martial law is absolute.

* Duke of Wellington quoted in Finlason on Martial Law, VI., VII. In re Egan, 5 Blatchford, 320.

† Finlason, VI. VII.

‡ In re Egan, 5 Blatchford, 320.

§ Whiting, War Powers, 293.

‖ Whiting, War Powers, 170, 163.

¶ Finlason, XXXVI.

Common military law, likewise, exercises a restraining influence, since, under it, military men may be tried for acts opposed to the usages of the services, and for specific violations of the Articles of War.

It is proposed to discuss specifically, in the course of this article, the responsibility resting upon officials for the declaration and continuance of martial law, and for actions done thereunder.

V. LIABILITY FOR DECLARING AND CONTINUING MARTIAL LAW.

As to the declaration of martial law, it has been seen that the right pertains to the President and his military subordinates, and to the governor and his military subordinates, each authority acting within his own jurisdiction: That, also, the right rests within the discretion of the State Legislature, and, therefore, presumedly within that of Congress. But, martial rule having been proclaimed, it may be stated that the general principles regulating the relative power of the executive and legislative branches of the Government, apply, Congress or a State Legislature may therefore effectually control the military power, by refusing to vote supplies, or to raise troops, or by impeachment; but beyond that, for the conduct of military operations essential to overcome residence, the authority of the Executive is supreme, except so far as he may be controlled by ruled made by the legislature in accordance with Article I, sec. 8, of the United States Constitution, or by proper enactment under the Constitution of the State.* As to the liability of the person proclaiming martial law, it may be said that, with certain qualifications, the common law, in assertion of its supremacy, will punish, civilly and criminally, for unwarranted action.

But the qualifications are important. By the necessities of the case, a liberal rule must be applied; since it would be a peculiar hardship to place responsibilities upon men, if indeed men could be found to assume them, during a time of danger, when action is necessary, and irresolution, often fatal, and then hold them liable to the severe rules that govern ordinary actions in times of public calm. It is to be considered that various elements enter into the declaration of martial law, and very properly, which, if susceptible of proof, would often prove to be inadmissible under the rules of evidence; such, for example, as the character and condition of the disaffected, their preparations, their signs and symptoms, relative strength, strategical capacity of the country, condition of warfare, information or belief, hearsay and rumor. The rule is, that the President, Governor or Military Commander, may, in the exercise of an honest discretion, proclaim and execute martial law. The law is not that such an authority can arbitrarily, and without honest belief in the necessity, institute martial rule, and then act under it as arbitrarily as he please, either against persons not subject to it, or in cases not coming under it, and the like; "but that, assuming that in the honest exercise of his judgment, he declares martial law, in a state of things in which he might honestly and not unreasonably believe to be a case for it, then for what is done under it, in accordance with military usage in such cases; or on the other hand done (without such

* 1 Whiting, War Powers, 163; see also Finlason, xxii.

authority), in excess of it, he is not legally liable."* The author, quoted, states, (page 186), that the Lord Chief-Justice, in the case against Governor Eyre, charged, in effect, that if the jury thought the accused had acted honestly, and under an honest and reasonable belief of authority, they should dismiss the case.

And this rule would apply, even though measures taken might turn out, in the event, to have been excessive or beyond the necessities of the case.† The author quoted,‡ considers the Irish and Colonial bills granting power to declare martial law as declaratory of the general principle; and since the power is conferred upon the Governor of declaring it, when he should think it necessary or expedient, and of taking measures, deemed by him to be necessary and expedient—it is manifest that he is to be protected in his honest views, either in declaring, continuing, or exercising martial law, and there can be no legal liability.

This rule corresponds with that rule of universal application in the law that the honest exercise of a discretion, where discretion is conferred or necessarily inferred, is to be protected. It is stated by Mr. Finlason§ that when the cases are closely looked at, it will be found that there are none in which the judgment of the commander or governor, on measures for the suppression of mutiny or rebellion, has been left to a jury—but whether the mutiny or rebellion was merely set up as a pretense, to indulge vengeance, malice, revenge, under color of it, and not really under it. In the case of Griffin *v.* Wilcox, previously quoted, it is said: "How is the existence of the fact that the civil power is superseded by illegal, forcible resistance, to be ascertained? It is a fact to be proved on trial *or* decided by the Court upon judicial knowledge." The authority proclaiming martial rule illegally would be responsible for all acts done under it, in its ordinary exercise, though not for acts of excess or abuse *not done* by his order or direction.‖

The precise moment when martial rule is justifiable, the instant that the civil authority is overthrown, is a question upon which there would be many opinions; and whether the necessity calling for it refers to the instant exigencies of a particular time and place, or to the larger considerations governing the suppression of a widespread rebellion—indicates the character of the considerations of which a jury must judge, and demonstrate the reasonableness of the rule that it is only for acts of malice or cruelty; that those are to be punished who set martial law in motion.

And so, the question determining the continuance of martial law are similar to those regulating its declaration.¶

While, as we have seen, its continuance cannot be justified beyond the time when civil courts and functionaries may resume their duties, yet this precise moment is not absolutely determinable—there is scope for the exercise of discretion; and honesty and reasonableness, in its exercise, will be ample justification before a court.

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* Finlason's Commentaries on Martial L., 50.
† *Ibid*, 231.
‡ *Ibid*, 47.
§ 74.
‖ Finlason, 73, note.
¶ Finlason, 208.

Governor Eyre stated on his trial that he had continued martial law two weeks beyond the cessation of rebellion, to inspire terror, since there were apprehensions of further disturbances; also to provide for dealing out summary punishment to rebels in custody; that danger did not cease with actual hostilities, there being a disposition to further disturbances.

The question is one of necessity, and as long as it is reasonably certain that courts could not resume their functions if military rule were abandoned, it seems that martial law is justifiable.

It may be remarked, here, that the considerations affecting the declaration, execution, or continuance of martial law, are largely military, and, therefore, circumstances should be viewed from the standpoint of military men, and judged by the customs of the Service. In a trial arising from the execution of martial law, therefore, juries should give great weight to opinions of unprejudiced military men. It is said * that the necessity for martial law may arise by reason of common feeling among a large mass of population without arms or actual organization; that, however,† only overt acts, or overt acts in causing or abetting an actual rebellion, justify martial law.

While it is possible that a situation so serious as to justify the infliction of martial law may arise among an unarmed people, yet it is conceived that, as a rule, the ordinary procedure of civil functionaries, with the aid of the military, would be found equal to the situation; insurrection, as defined in G. O. No. 100—"the rising of people in arms against their Government or a portion of it, or against one or more of its laws, or against an officer or officers of the Government," and "confined to mere armed resistance, or having greater ends in view"—is thought to represent that condition of disorder and opposition which, as a rule, should exist before the proclamation of martial law.

VI. LIABILITY FOR ACTS DONE UNDER MARTIAL LAW.

The question of the liabilities of the military for acts done under martial law is of paramount importance. It was stated by the House of Lords, in the case of Johnston *v.* Sutton,‡ that for abuse of military discretionary power in time of war the courts of common law have no jurisdiction; for whether it was an abuse or not is a question so much dependent upon military exigencies and considerations, that the common law courts will not take cognizance of it, and a jury cannot judge of it. Commanders in a day of battle, it was said, must act upon delicate suspicion, or open evidence of their own eyes; they must give desperate commands, they must require instantaneous obedience; a military tribunal is capable of feeling all these circumstances, and understanding them. And this view is adopted by Mr. Finlason in his exhaustive treatise, with, however, important qualifications. He says, page 416: "It would be practically to abolish the power of declaring martial law, if the validity of acts done under martial law were to depend upon the soundness of the judgment exercised in declaring or continuing martial law; for no officer would be likely to accept such a large and

* Finlason, xxii.
† Ibid, 130.
‡ 1 Term Rep. 549.

uncertain responsibility. According to the views submitted in these pages, all acts done *during* martial law, and in the district *under* martial law, and under military orders and authority, would be legal, and would therefore not require a bill of indemnity. And all such acts done in or out of the district, and whether or not strictly under martial law, would be, if honestly for the suppression of the rebellion, proper subjects for a bill of indemnity." The qualifications are expressed as follows: "And on the other hand, if the acts were not really done either *under* martial law nor in suppression of the rebellion (that is, with a view to it), although during martial law and under color of it, but wantonly and wickedly," no bill of indemnity would cover it. Since the rule in Johnson *v.* Sutton applies to acts done under a state of war, it is to be noted that the U. S. Supreme Court, in the case of Luther *v.* Borden, expressly decided that "it was a state of war" in Rhode Island after the declaration of martial law. It may be remarked here that it has been the practice of the British Parliament to grant indemnity to those who acted illegally but honestly in suppression of rebellion; that in 1863 Congress, by a certain act, made the order or authority of the President a defense in any court of the United States, or the States, in a suit for arrest, trespass, or other act made or done by such authority, during the War. Whatever may be the view of this class of legislation, that prevails in the British courts, it appears to be the tendency of American tribunals to pronounce it unconstitutional. This was expressly so decided by a Kentucky court,* while the Supreme Court of Illinois said: "So where a person is illegally arrested under the President's order, the remedy against the person making the arrest cannot be taken away by Congress."† Mr. Finlason, while taking a strong position as to the exemption of the military from trial by civil courts for acts done under martial law, yet recognizes‡ that in cases of a total want of jurisdiction or authority; of acts done under color of, but not under martial law, for private malice or revenge; and for acts done without order or authority—the trespasser may be held answerable. He contends§ that mere misconduct is a matter of military cognizance; but that criminal acts, wanton and wicked, if not summarily punished under martial law, are for the cognizance of the criminal courts. In Le Caux *v.* Eden,‖ a prize case, Lord Mansfield said: "If an action would lie by the owners and every man on board ship, taken as a prize, against the captain, and every man on board his ship, no man would dare to take a ship." This view was confirmed by the Court, although it held there might be cases in which law courts might have jurisdiction for personal ill treatment or excessive cruelty. In the case of Keighly *v.* Bell¶ it was held that orders are an absolute justification in time of actual war, as regards foreigners or enemies, and as regards English subjects, unless the orders were such as could not legally be given, or justified, such as the torture of a child. Therefore it may be accepted that the correct rule is, as stated in Stephen's History

* Elfort *v.* Bevins, 1 Bush, 461.
† Johnson *v.* Jones, 44 Illinois 143.
‡ p. 72.
§ p. 444.
‖ 2 Douglas, 594.
¶ 4 Foster and F., 790.

of Criminal Law,* that martial law does not justify cruel and excessive measures, that for such excess offenders are liable civilly and criminally. The Supreme Court† said, speaking of authority exercised under martial law, that "If the power is exercised for the purpose of oppression, or any injury wilfully done to person or property, the party by whom or by whose order it is committed would undoubtedly be answerable." Civil and criminal liability would follow private wrongs committed under color of martial law, and unnecessary force or oppression, or arbitrary force not within the scope of the necessity.‡

And so when a sheriff flogged a man, not implicated in the rebellion, but while martial law existed, he was held liable to damages.§

There are many cases in the English reports, and some in the American, where officers have been held liable for floggings, arrests, imprisonments, or other punishments illegally imposed, but these were all cases where there was a lack of authority either generally or in some particular respect, or felonious or malicious intent, and they are, moreover, all cases of regular military law.‖ An error of judgment, simply, where there is jurisdiction, will not incur liability;¶ and therefore, if an officer, in the honest exercise of his duty, makes a mistake in arresting a friend instead of an enemy, or in detaining a suspicious person, who may be finally liberated, he is not responsible for such error in criminal or civil courts.** The author says that "any other rule would render war impracticable, and by exposing soldiers to the hazard of ruinous litigation * * would render obedience to orders dangerous, and break down the discipline of armies.

In martial law, officers may lawfully arrest any one "who, from the information before them, they had reasonable ground to believe, was engaged in the insurrection, and might order a house to be entered and searched, where there was reasonable grounds for supposing he might be there concealed."

Without the power to do this, martial law and the military array of the Government would be mere parade, and rather encourage attack than repel it. "No more force, however, can be used than is necessary to accomplish the object."*† We are informed that no officers, in executing martial law in Jamaica, in 1867, deemed that their orders, though a legal justification, justified them in disregarding considerations of humanity;*‡ that the possession of plunder alone did not warrant capital execution; that men in bodies willing to submit, or surrender, or could be captured, were not to be attacked or fired at. These views correspond with the definition of General Orders No. 100: "Martial law is simply military authority exercised in accordance with the laws and usages of war. *Military oppres-*

* I. 215; see also Papers of Juridicial Society, Vol. III., 221.
† Luther v. Borden, 7 Howard.
‡ Prof. Joel Parker on Martial Law, 37; see also, Bouvier's Dictionary, "Martial Law."
§ 27 State Trials, 765.
‖ Finlason, 85.
¶ Finlason, 75.
** Whiting, War Powers, 168.
*† Luther v. Borden, 7 Howard.
*‡ Finlason, 320.

sion is not martial law; it is the *abuse* of that power which the law confers. As martial law is executed by military force, it is encumbent upon those who administer it to be strictly guided by the principles of justice, honor and humanity—virtues adorning the soldier even more than other men, for the very reason that he possesses the power of his arms against the unarmed." This famous order, the work of Dr. Francis Liebers, represents war and its attendant circumstances as viewed in this age, when civilization has stretched forth her hand to stay even the barbaric atrocities of national disputes; when the principle is recognized that warfare should entail the fewest, not the most, miseries.

The principle contended for by Clode, in his work on military and martial law,* and by Finlason,† that a military officer, in carrying out martial law, should be free from all responsibility in its initiation, would, probably, receive practical recognition in cases arising from the execution of martial law, and this because of unreasonableness of asking men to postpone action until they have an opportunity of deciding whether the proclamation is justifiable; because of the serious injury to discipline and fear of action that would result. Theoretically, however, the same rules would apply that, under other conditions, govern the superior and inferior; the declaration might not be justifiable, but this fact must be obvious to the ordinary understanding, plainly and unquestionably, before the officer proclaiming, or his subordinate, can be held liable before a court of justice. And similarly, no subordinate can be held answerable for obeying an illegal order, where that order is not plainly illegal. An so in the execution of an order no amount of excess in honestly carrying out martial law—*i. e.*, excess as it *turned out* in the event—would render the officer amenable to civil or criminal prosecution. As long as there is honesty of purpose, and absence of actual and implied malice, there must be absolution.

Necessity is the keynote; obviously, measures which would be justifiable in a serious insurrection would be excessive under a less serious condition of affairs; and so it is that "the officers of the Crown are justified in any exertion of physical forces, extending to the destruction of life and property to any extent and in any manner that may be required for this purpose"‡—where punishment is not inflicted after resistance is suppressed, and after the ordinary courts of justice can be reopened, and where measures are not plainly excessive. "It was the opinion of Governor Eyre that in the long run any amount of just severity becomes a mercy, and that the exaction of the last penalty from the few has, in all probability, saved the lives of many, and prevented a protracted strife."§

VII. INCIDENTS.

In the execution of martial law, it is to be remembered that a species of rule exists different from that of the common law, different in the character of the offenses, penalties, methods of procedure, powers of arrest, nature of proof required, and the mode of trial. The scope of martial law, it has been

* p. 158.
† p. 54.
‡ Op. of Att'y and Solicitor-Gen'ls, Forsyth.
§ Finlason, 238.

said, is not so much criminality as public safety, not so much legal culpability as military exigency; danger rather than guilt is the guiding principle in inflicting punishments.

The effect of a legal proclamation is to place all persons in the district under military control,* subject to military rule and usage. Martial law may be carried into effect as well by civilians as by soldiers,† with the qualification, however, that none must act except under military orders, except, of course, in self-defense, or in resisting violence, or in the arrest of offenders, in quelling riot or preventing felony. Civilians and volunteers have in the past been guilty of barbarities and atrocities. Searches and seizures may be made without warrant, and arrests made without process—no claim for damages being furnished except in case of abuse;‡ a suspicion of general complicity is sufficient to justify an arrest. Soldiers, themselves, are subject to martial law; it is said that the Duke of Wellington executed soldiers under martial law for breaches of the civil law—having been caught plundering.§

A man in actual armed resistance, or red-handed with weapons showing recent conflict, may be put to death on the spot under the orders of competent authority, or, if arrested, tried in any manner which such authority may direct.‖ But for abuse, for acts not *bona fide*, to suppress rebellion and in self-defense, but to gratify malice or the caprice of tyranny, the party doing them is responsible. The most careful inquiry under the circumstances is to be made.¶ The Duke of Wellington, in a general order of November, 1811, made Provosts responsible for the custody of prisoners, preservation of good order and discipline, and gave them authority to punish those found offending; which punishment was to be limited to their own view of the crime, and not to be imposed by their subordinates not commanding officers.** Mere passive complicity in the insurrection was not, in Jamaica, punished capitally; nor even the possession of plunder, unless such possession was actually connected with some murder or attempted murder; the possession of the property of those recently murdered was deemed sufficient to justify summary execution in absence of any explanation. Colonel Tyfa shot without trial a man found wearing the ring of one of the victims! No punishment was imposed until after satisfactory inquiry.*† Wisdom has determined the necessity of keeping the military under strict control in those times of general disorder, and therefore the entrance of houses and foraging, except under the eye of proper authority, should be discountenanced. Circumstances will suggest to military commanders rules for the guidance of civilians, to the end that order may be preserved as far as possible, and the peaceably disposed separated from the riotous. We have seen that civil courts may exist, and, within the discretion of the military commander, exercise their functions.

* Finlason, xiii., note; 55.
† Law Magazine, N. S., vol. 14,208; Finlason, 86.
‡ Joel Parker on Martial L., 291; Whiting, 176.
§ Clode Mil. and Mar. L., 160.
‖ Forsyth, 214.
¶ Finlason, 86.
** Clode M. and M. L., 160.
*† Finlason, 138.

It will therefore be the method of wisdom to turn over for punishment to the civil authorities such offenders as do not need to be made an instant example.

Commanding officers holding prisoners under martial law cannot be required to bring them up for examination under municipal law;* and "it requires but a moderate degree of common-sense to arrive at the conclusion that a commanding general marching to the battlefield * * in performance of his military duty, to suppress an insurrection, is for the time exempt from arrest in *civil* process, whether the action be in contract or tort. And so as to obligations to obey a writ of habeas corpus. But if the civil responsibilities existed in time of peace, the refusal to make a return would be contempt of court, for which attachment should issue. If we find no special exemption from the operation of the civil process in such cases in the Constitution or laws of the State, the exemption will rest * * upon the military responsibility which then rests upon him, and the military law by which he is governed under the Constitution altogether inconsistent with and superseding civil responsibility."†

VIII. TRIBUNALS AND RULES GOVERNING EVIDENCE.

Concerning the nature of the tribunals that shall adjudge cases under martial law, it is a general rule that the analogies of courts-martial under ordinary military law shall, as far as may be, be followed. We have seen that circumstances may justify punishment upon the most informal inquiry. It has been the English practice to permit civilians to sit with military men upon these courts; the Duke of Wellington says that judges sat enforcing martial law under him.‡ Drum-head courts-martial are recognized by courts of law and military courts in England.§

The American practice is set forth in the matter of Egan‖: "The commander is the legislator, judge, and executioner. His order to the provost-marshal is the beginning and end of the trial and condemnation of the accused. There may be a hearing or not, at his will. If permitted, it may be before a drum-head court-martial, or the more formal board of a military commission, or both forms may be dispensed with, and the trial and condemnation be equally legal, though not equally humane and judicious."

The military commission has become the chief tribunal of American wars; its jurisdiction is derived from the common law of war,¶ and in several instances from statutory enactments; but universal as was the use of this commission during the Civil War, it remained substantially without statutory limitation as to its jurisdiction, composition and procedure.

It has grown into a custom, however, to apply to them the rules governing general courts-martial;** they have been convened by the same officers

* Joel Parker on Mart. L., 32.

† Joel Parker, 21.

‡ Clode's Military Forces of the Crown, II., 502; also, II., 162.

§ Finlason, 82.

‖ 5 Blatchford, 320, 1866.

¶ G. O. No. 100.

** Digest Op., J. A. General, 326; same course recommended by Clode, Military Forces Crown, II., 162.

as are authorized to appoint general courts; charges and specifications have been perfected; their proceedings and record have been similar, and their sentences similarly passed upon and executed. The minimum of members has been fixed at three, while a judge-advocate has generally prosecuted. Therefore a military commission with less than three members, or without a judge-advocate, would be opposed to precedent; but, in the absence of statutory provision, a failure to conform to usage in any of these particulars would not necessarily invalidate the proceedings.

It has been held by the Judge-Advocate-General that the analogy should extend to swearing of members, to the granting of the right of challenge to the accused, to the necessity of a two-thirds vote in capital sentences, to the application of the statute of limitations. Military commissions punish infractions of the laws of war, and at the direction of the chief military authority, for civil crimes, assuming the functions of courts of law, during their suspension. "All civil and penal law shall continue to take its usual course in the enemy's places and territories under martial law, unless interrupted or stopped by order of the *occupying* military power."*

While courts of law may be authorized to sit, it is not to be understood that they may interfere in cases where their process would impair the efficiency of the military force.†

It is further laid down by the order referred to that sentences of death shall be executed only with the approval of the chief executive, provided the urgency of the case does not require a speedier execution, and then only with the approval of the chief commander.‡ These requirements are the latest authoritative regulations of the right to punish under martial law, and must govern in lieu of previous rules opposed to them. Provost courts were frequently constituted during the late War* as a substitute for the ordinary police courts, having special jurisdiction over municipal offenses, and offenses against the military regulations of a town. They often took cognizance, however, of suits of importance, civilly and criminally.§ military commissions acting both in their military and in their civil capacities, exercised jurisdiction over offenses committed before the initiation of martial law but not previously brought to trial.‖ This procedure prevailed in Jamaica on the occaaion of martial law, in 1867; we are informed that most of the executors were of those who had murdered before martial law had been proclaimed.¶ A similar question arose at that time concerning the right to arrest an offender out of the district and bring him within it for trial. This was done in the case of Gordon, who was subsequently executed. The Royal Commissioners, who inquired into the execution of martial law, in this instance did not question the legality of the arrest out of the proclaimed district, and the subsequent trial and execution. This is thought to follow the analogies of the common law, which makes a crime

* G. O. No. 100.

† Joel Parker on Hab. Cor., 38.

‡ This was essentially the practice in Jamaica; Finlason, 148, 39.

§ Digest Op., J. A. G. 307.

‖ Right to do this disputed by Clode, Mil. Forces Crown II., 162.

¶ Finlason, 102.

local; what would be the view of American courts on this point, it is impossible to say.*

The military commission cannot usurp the statutory functions of courts-martial; nor punish soldiers for offenses cognizable under the Articles of War, unless, as is the case in several instances, they have concurrent jurisdiction with such courts,† nor shall sentences of such commissions, not carried into effect or entered upon, be executed after the discontinuance of martial law. Nor has a military commission jurisdiction if civil suits or proceedings, either in contract or tort, arising from private transactions or personal injuries; their function is to punish offenses under the law of War.

Such causes might be brought before special tribunals or designated individuals, authorized to consider them by the rules of War—such tribunals were the Provost Courts of the late War.‡

It was the opinion of an eminent English lawyer, quoted by Hough, that courts under martial law which condemn to imprisonment and hard labor belie the necessity under which alone the jurisdiction of such courts can lawfully exist in civil society, *i. e.*, the necessity of self-preservation by the terror and example of speedy justice. But practically a different rule has been followed, and we find, that, as the assumption that the right to inflict a lesser punishment was included within the right to inflict the greater, penal servitude was among the penalties of martial law courts in Jamaica: § also, that during the Rebellion, military commissions punished by imprisonment for a definite time, or "until the end of the War," by fines, by sending beyond the lines of the forces, by confiscation of property at times; and by requiring the taking of an oath of allegiance, or the giving of a parole, and in some instances a bond for future good conduct. ‖

Of the liabilities of those sitting on courts under martial law, or those carrying out the sentences thereof as reviewing authority, it may be said, generally, that "an officer who had wholly disregarded the essential and primary obligation of justice, and condemned men unheard, could not set up that he was carrying out martial law, for that would imply that martial law was iniquitous; whereas, the worst that can be said of it is, that it is rough and summary justice."¶ And as to any subsequent impeachment of the proceedings of court or commanding officer acting in conjunction with it, it seems to accord with authority that it would be for those impeaching such proceedings, to show that there was no evidence to sustain the conviction, and that the court knew it, or might have known it or seen it, if they had not been culpably reckless, or in a conspiracy to destroy him with or without evidence.** Malice or a knowledge of innocence, not simply a mistake of judgment, is required to create liability; this rests upon the general principle that members of inferior courts, not of record, are not amenable for mistakes of judgment within their jurisdiction; the onus rests

* Ibid, 102.
† Digest Op. J. A. G., 333.
‡ Digest Op. J. A. G., 333.
§ Finlason, 387.
‖ Digest J. A. Gen'l., 334.
¶ Finlason, xxxvi.
** Finlason, 197.

therefore, upon the plaintiff to show not only the absolute innocence of the person condemned, but the corrupt and malicious action of the court or commanding officer.

It is to be observed that where a court-martial has acted on a matter within its jurisdiction, there can be no review of its action, no such thing as a court of error on its judgment; and no reason is seen why this rule should not apply to courts acting under martial law. But only overt acts are proper subjects for the execution of martial law;* seditious language alone would not justify it.

As to procedure and the evidence required to support conviction, it seems clear that the strict rules of criminal judicature of common law, would, if applied, cause martial law to fail entirely of its object,† which is the prompt and speedy application of deterrent measures.

John Stuart Mill, in his history of India, criticizes the common law rules of evidence as does Jeremy Bentham, with contempt, saying that summary courts are courts of natural procedure, because they are unfettered.‡ While this view is by no means general, yet it is conceived to be correct in so far as it asserts that justice may be done and the ordinary rules of evidence neglected. Therefore, while the methods of the common law, need not be religiously followed, their objects, the doing of justice should be sought under all circumstances, and prisoners should be accorded a patient hearing, and their witnesses be heard; they should be permitted to examine and cross-examine, and to comment, and should be accorded an adjournment if necessary to the ends of justice;§ all reasonable doubt should be excluded by the evidences; all evidence is admissible and objections should go to the weight or credibility;‖ only clear cases seould be dealt with, and difficult ones be left to courts of law.

The legality of every military arrest, which is included under the general rule that honesty will acquit even in cases where the person arrested was innocent, of every trial and punishment must be determined upon its own circumstances, and not by an inflexible and general rule.¶

The correct view of martial law, executed as it should be, with severity, perhaps, but above all, with justice, is, that it is a public good, affording a sure and speedy antidote to such civil disorders as for the moment, paralize the body politic; the evil exists not in the remedy, but in the malignant distemper that renders its use necessary. The remedies for an abuse of martial law are found, as has been pointed out, in the amenability of the President or Governor to impeachment; of military officers and soldiers to civil and criminal law in the case of criminality, and to military law for actions in violation of the customs of the service, or the Articles of War; in the frequent change of public officers; and in the dependence of the troops upon the pleasure of the legislature.

* *Ibid*, 130; see also Whiting, War Powers, 43.
† Finlason, 61 note.
‡ Finlason, 67.
§ Finlason, 408.
‖ Finlason, 359.
¶ Pomeroy on the Constitution, 477.

A DISCUSSION OF CAPTAIN ROGERS BIRNIE'S PAPER ON "GUN-MAKING IN THE UNITED STATES."*

LIEUT.-COMMANDER F. M. BARBER, U. S. N. *Gentlemen :*—Captain Birnie's very exhaustive and correct treatment of the subject leaves nothing to be said except in the way of praise. The year 1887 will be memorable in the history of gun-making in the U. S. from the fact that never before have the advocates of the different material for, and methods of, gun manufacture appeared before the various professional societies of the country and laid before these judges the variety of information, theory and fact in possession of each for comparison.

Commencing with the Dorsey paper before the Naval Institute in January, we have had that of Mr. Metcalf before the Society of Civil Engineers, that of Mr. Morgan before the Society of Mechanical Engineers, renewed discussion of Mr. Metcalf's paper in the Society of Civil Engineers, the paper of Mr. Cowles before the Naval Institute, and finally, that of Captain Birnie before the Military Service Institution.

At the close of the discussion before the Society of Civil Engineers Mr. Metcalf (who is an ardent and able advocate of steel-cast guns) paid a high tribute to the ability and knowledge displayed by our Ordnance officers of the Army and Navy, and congratulated the community on the fact that officers had at last been drawn out of their shells and had given the public the benefit of their information. I think that in coming out of *his* shell, Captain Birnie has shown himself in this paper to be the largest-sized Government mollusk that has yet appeared in print ; his assertions are supported by official records, his theories are sound, and are demonstrated by mathematical calculations that are irrefutable, and they are proved by experimental observation of the most elaborate character. The conclusion which he draws that the built-up forged steel gun, which has been adopted by both Army and Navy, is, at the present day, the best gun both from a manufacturer's and an artillerist's point of view, seems to be perfectly sound and inevitably deducible from the facts in the case.

His mathematical discussion of the steel-cast gun, and the line of practical investigation which should be followed in order to develope its greatest possibilities, is new and particularly interesting, in view of the fact that there are still many people in the U. S. who believe that the true solution of the great gun problem is to be found in making it of one piece of unforged cast steel. In connection with this matter it is to be noted that within the week the newspapers have reported the bankruptcy of the "Compagnie des Fonderies et Forges de Terre Noire" in France, a wealthy company that, a few years ago, employed more men than any other in the world, Krupp's not ex-

* Read before the Military Service Institution at Governor's Island, N. Y. H., Nov. 26, 1887, and printed in Monograph VIII.

cepted. This firm made a specialty of unforged cast steel, but were never able to get beyond hoops in even small-sized guns. They were the most famous firm in the world for this kind of work, and their process has been adopted with success by the Swedish government at Bofors for making solid steel guns up to four inches in diameter—above that, however, to six inches, the guns are hooped; beyond that they do not go at all.

The present published condition of the VI.-in. steel-cast guns of the U. S., referred to by Captain Birnie on page 71, is as follows: The Bessemer gun has been successfully cast; it is solid, and is now being rough-bored. The open-hearth gun is to be cast hollow on the Rodman principle, but the attempt has not yet been made. It may be interesting to tabulate the physical characteristics thus far published regarding the metal of the Bessemer gun, and those required and obtained by the Naval Bureau of Ordnance, in the tubes and hoops of the VI.-in. forged-steel guns made at Midvale.

Specifications as bid for Bessemer gun—tensile strength, 80,000; elastic limit, 40,000; elongation, 7 per cent.

Published as obtained after casting (unofficial)—tensile strength, 95,000; elastic limit, 50,000; elongation, 12 per cent.

Midvale tube, after treatment (official)—tensile strength, 80,000; elastic limit, 35,000; elongation, 22 per cent.

Midvale hoops, after treatment (official)—tensile strength, 96,000; elastic limit, 47,000; elongation, 15 per cent.

The effect of treatment is to increase the tensile strength and elastic limit, and to diminish the elongation, the latter by about one-third or one-fourth, and the Bessemer gun would not appear to have elongation enough even before treatment. It is to be hoped that the Military Institute will be able to obtain and publish with this discussion the results of the official tests soon to be made of the specimens taken from different parts of the Bessemer gun.

Captain Birnie's paper forms a fitting closing to the copious discussions of the year, and will furnish a final and convincing proof to the manufacturing community that the constituted authorities of the Army and Navy know what they want in gun metal, and how to use it after they obtain it.

Brevet-Brig.-Gen. H. L. Abbot, Colonel Corps of Engineers.—Captain Birnie has compressed into small space a very instructive statement of the results of a series of experiments scattered through a term of years, and not heretofore easy of access. It is no small service to bring into one picture the tombstones of past failures and to group them in a manner to indicate where the path of safety for the future is to be found. This he has done, and I trust in a way to carry conviction to disinterested minds. It is time to recognize that there is such a thing as a science of gun-making, and that certain theories which a quarter of a century ago were worthy of experimental investigation are no longer so to-day.

As an engineer I am specially interested in the experiments with mortars in progress at Sandy Hook. There can be no doubt that this weapon is destined to play a more important part in the defense of our coasts than heretofore. It has been developed abroad under the name of Howitzer, until a gain of fully 200 per cent. in effective force of impact, and a gain of upward of 300 per cent. in length of effective range, have been secured. The cost of manufacture, and especially of emplacement, is small as compared with that of guns. The Fortification Board, of which Secretary Endicott was president in 1886, recommended 724 heavy mortars and 581 high-power guns of all calibers for the defense of our entire sea-coast. Evidently the development of the best pattern and mode of construction is a matter of the highest importance; and it is earnestly to be hoped that the Ordnance Department is not to be hampered, as heretofore in other directions.

by the pressure of interested parties urging their own wares upon the attention of Congress.

While heartily concurring in most of the views expressed by Captain Birnie in this interesting paper, I am constrained to dissent from his estimate of the practical value of the pneumatic gun in coast defense. Its short range restricts its fire to the area obstructed by submarine mines, and we cannot afford to make every shot which misses the enemy a countermine to destroy them, and thus open a route for his passage. The mines are indispensable, because steam vessels can force their way through any unobstructed channel under cover of darkness, whether the projectiles thrown at them contain gunpowder or dynamite ; and we cannot introduce a new weapon that directly antagonizes another of prime importance which it cannot replace.

If it be suggested that the use of the "aerial torpedo" may be restricted to the period of the siege when, the submarine mines having been destroyed by the enemy, he is ready to attempt to pass the forts, we must call to mind that this invention is more nearly allied to a mortar than to a gun in the character of its trajectory. Although an advocate of the use of vertical fire, where properly applicable, I draw the line where the target is in rapid motion. When the channel is once opened the ships will pass at full speed, and it will be of little use then to assail them with any kind of mortar projectile. Outlay invested in these pneumatic guns could, in my judgment, be better spent for other means of defense.

The weapon rests its claim for introduction into service upon its exclusive ability to throw high explosives with safety ; but it is stated on good authority that mortar shells charged with 110 lbs. of wet gun-cotton are even now fired successfully in Germany, and improvements in the compositions of high explosives is making so rapid progress that there is reason to expect an early use for them even in guns. Under these circumstances I think the company have done wisely in preferring to bring their invention to the attention of the Navy rather than to that of the Army. As a counterminer to destroy submarine mines it may have value, although without actual proof I should be loth to assume that it could do more than moderately assist in the opening of that *known and well-defined channel from four to six miles long*, without which no armored ship will safely pass our forts. The gallantry of our enemies is assumed, but there will be conspicuous need for it in maneuvering an unarmed floating magazine, containing many tons of dynamite, under the fire of modern high-power guns mounted on land at a range of one or two miles.

BREVET-MAJOR J. B. CAMPBELL, CAPT. 4TH ART.—Capt. Birnie's paper begins by mentioning the period of brief superiority in Ordnance that the genius and industry of Rodman and Dahlgren vouchsafed the United States, and laments the decline in the art of gun-making in our country, except in the direction of small arms and machine guns.

He pointedly remarks that for the inception and proof of the principles and practice of gun-construction now acknowledged to be fundamentally correct, the world is indebted to citizens of the United States, and leaves it to be inferred that the want of support and development of these practices in our country is due to want of appropriations by Congress.

He doubts the advisability of changing the direction or control of armament construction from that of personal responsibility, assisted by a body of life-long officers, trained for their business at Government expense, to any other plan, and hopes that, in any event, the decision of the question *what guns the Army shall use* will be entrusted to military men. If, by military men, he means those who are to use the guns in repelling danger, he will have a large following. It will be otherwise if the term is construed to mean the non-combatant corps of designers, constructors and inspectors that

has heretofore controlled this question. Looking beyond the United States, it will be observed that almost all of the really great progress in gun-making has taken place in countries that have no national foundries and gun-shops, and no exclusive corps of Ordnance designers and manufacturers. In fact the nations who were not encumbered with the latter, were the first to derive benefit in their armament from the ingenuity and skill of private inventors and manufacturers. Whitworth and the Elsnick Works in England occupy the attention of the world rather than the national establishment at Woolwich, and the latter has been successively driven from almost every one of its assumed positions by the superior practice and productions of the finest establishments.

Krupp and Grusen are the dependence upon which the Government of their country, as well as several foreign ones, rely. France, accepting through defeat and humiliation, the lesson taught her by the national patrons of private enterprise, realized that the official exclusiveness and perfunctory ruts of the national shops and foundries of Gavre, Bourges, Ruelle and Nevers, were a poor reliance in the supreme moment, and called to her aid in the necessity for re-organization and re-armament the science, skill, emulation and progress of St. Etienne, Le Creusot and St. Chamond.

Austria, with her Vienna establishment, her Von Lenk and Von Uchatius, and their years of official failures, wholly or in part, has followed the example of her more youthful and progressive neighbor, Italy, and now gets her armament where it can be best, most successfully and cheaply made.

In Russia, only, do government establishments appear to prosper and produce acceptable material. It is a question whether this is not to be attributed to the purely despotic and personal government, where the sovereign's will, unimpeded by turbulent scheming and pipe-laying legislatures says *what* shall be done, *how* it shall be done, and *who* shall do it. It is for the Czar's interest and safety to get the best attainable to serve him in all capacities, and he does it. Even in Russia, following the general rule, government works are mere imitators. Rarely, if ever, are original conceptions produced by public functionaries.

A small gun-shop, for experiment and investigation, would probably be a desirable plant for the United States to possess, but the Government, whose chief and only mission should be to make and administer the laws, and protect the country from exterior and interior harm, should never be a manufacturer, or enter into any other kind of business, for the simple reason that in competition with private enterprise it falls behind and becomes extravagant; this will ever be the case as long as a hired agent is inferior to a principal. The vitality and progress inspired by successful competition, and supported by the acumen necessary to avoid the expense of failure, cannot be expected of those whose existence is equally comfortable in failure or success. Let the Government officers select the gun best suited for the purposes desired—or invent it, if they can—inspect the material of which it will be made, superintend if you will the work of construction (although I believe neither of these are done in Europe), and test it when completed; but let the American manufacturer make it.

The running history of guns, both conceived of and made, is very interesting and instructive, accurate, and as full as could be made in the narrow limit of an evening lecture.

The explanation of the principles of construction of built-up steel guns is clearly and concisely put, and should go far to convince all of the fact that such guns, when they are properly designed, and when the mechanical construction accurately and faithfully follows the design, are within reach, powerful, reliable, and safe, no matter what may be said of other guns. The worst that can be said against them is the great difficulty in accomplishing the minute mechanical accuracy of design that is indispensable to the

safety and perfection of the system in such large masses of metal; and of securing within them the desirable uniformity of required or assigned physical properties. The liability of latent interior defects in the masses has practically disappeared with the introduction of improved metallurgic methods, and in the latest, or De Bange development of the system, wherein by decreasing the dimensions, and proportionally multiplying the number of the masses, their homogenity is rendered more certain, the strength of the gun is increased, and the cost of the plant necessary to manufacture them is decreased. Capt. Birnie has been a faithful student of, and an untiring investigator in the interesting problem of the development of the built-up steel gun, and his modesty has concealed the fact that both the science and art of building steel guns on the principle of initial tension owe not a little to his industry and ability.

The steel wire-wrapped guns of Longridge, Woodbridge, Schultz and Armstrong, may really be considered as the ultimate development of the hooped or built-up gun. The perfect interior state of the walls of a gun, as far as initial strain is concerned, can be made to more nearly and surely approach theoretical requirement by wire-winding them than by any other way. This construction is receiving attention in all countries interested in gun problems, and it is hoped experiments with it will not cease in the United States. While it is not condemned by Capt. Birnie, he says little to encourage what he admits to be a promising problem.

Capt. Birnie, strong in his faith and admiration of wrought-steel tubes, jackets and frets, courageously attacks the rationality of attempting cast or homogeneous steel gun constructions. In these days of rapid development of the possibilities of metallurgy, it is dangerous to predict what cannot be done. But a few years ago it would have been thought madness to undertake to make a steel casting approximating in size to a five-inch gun. To-day such a casting is an accomplished fact, and the faith of its artisans in its inherent goodness of quality and strength is almost as great as is that of Capt. Birnie in his forgings. France and Italy have extensive and powerful armaments consisting of cast-iron guns, tubed and fretted with wrought steel. It is within possibility that a vastly better gun could be made by substituting cast steel for cast iron in such a combination, and it does not require a superabundance of credulity to expect to see initial strain as surely and accurately engendered within a homogeneous steel gun as in a built-up one. Such an achievement would not be nearly as great an advance as has been made in the science of gun-construction within the last fifteen years. Official conservatism must be kept out of danger of getting into a travelled rut. The trials and triumphs of Sir Henry Bessemer should ever be a warning restraint against unconsidered diapproval of the ideas of intelligent specialists and investigators. It is useless to say that the steel built-up gun marks the limit to improvement in Ordnance, with steel as the material to be used; and equally unwise to believe or assert that another metal or metallic alloy may not be found that, under proper treatment, will relegate steel, with all its noble and surprising properties, as far to the rear in the gun-making world as its intimate neighbors, cast and wrought-iron have been.

JOSEPH MORGAN, JR., ESQ.:—So much has been written upon the subject of our proposed new Ordnance, and the very complete and able resumé of Captain Birnie covers the ground so thoroughly, there is nothing more to say. The work in direction of new steel guns has been so well done by our Ordnance officers that I hope they may be allowed appropriations to continue it. My own views on this subject are well known. Whether our guns cost ten cents or one dollar per pound is not material, provided they are the most powerful tools of the kind to be had.

I believe forged and tempered steel of high elastic limit, properly assembled by shrinkage, gives the best guns known.

If material with an elongation of 7 to 10 per cent., and reduction of area 5 to 7

per cent., with an elastic 40,000 and ultimate of 80,000 is accepted, as in naval cast guns now under contract, why not use forged steel of 80,000 elastic limit, 135,000 ultimate, which has equal ductility, and raise the powder pressure, getting greater range and penetration?

THEODORE COOPER, ESQ.:—In appendix B the author in his investigation makes an assumption which is a very common one, but which is an erroneous one, *viz.*, that a metal having an elastic limit of 40,000 lbs. per square inch, as determined by the usual method of applying one kind of strain (tension or compression) from the zero point of strain, can be subjected to alternating strains of +40,000 lbs. to —40,000; or, in other words, that the compressive force ρ and the tensile force θ can each be worked to or near the above ordinary elastic limit.

Such a belief has been long prevalent and is still persistent. Many of the mysterious failures of our machines and structures are due to this false doctrine.

In 1867 Herr Wohler made a very valuable series of experiments upon iron and steel subjected to continued changes of strain of various kinds. These experiments were first published in English in "Engineering" 1871, March to June.

From the results of these tests, he concludes "that variations of strain may, with equal security, take place within the following limits; it being of course assumed that in all cases the maximum strain is less than that required to produce fracture under a stated load."

1st. Bars subjected to tension and compression:

Iron	+17,120 lbs.	to	−17,120 lbs.
	+35,310 "	"	0 "
	+47,080 "	"	+25,680 "
Cast steel for Axles:	+29,960 "	"	−29,960 "
	+51,360 "	"	0 "
	+85,600 "	"	+37,450 "
Untempered cast steel for Springs	+53,500 "	"	0 "
	+74,900 "	"	+26,750 "
	+85,600 "	"	+42,800 "
	+96,300 "	"	−64,200 "

2d. Bars subjected to shearing strains:

Cast-steel for axles	+23,540 lbs.	to	−23,540 lbs.
	+40,660 "	"	0 "

Although these experiments extended over years and some of the test pieces were subjected to as high a number of tests as 132,000,000, it must not be assumed that the above limits are exactly determined, even yet. They do, however, show that the capacity of a piece of metal to resist different kinds of strains is variable.

The explanation usually adopted is covered by the term "fatigue of metals," to my mind a very unscientific and absurd expression.

Upon reading the report of these tests when first published, it seemed to me that a much more probable explanation was that the position of the elastic limit moved, and should be measured from the initial strain. That the term "range of elasticity" would be more applicable. For example, in the case of his iron, the elastic range, until we approach the breaking limit, would be about 35,000 lbs., whether measured from —17,000 or from 0.

To assume that a material having an elastic limit of 35,000 lbs. would ultimately break down under strains not exceeding one-half of this amount, on the fatigue theory, would violate all conception of a perfect elasticity.

Whereas, to accept the idea that our material did have an *elastic range* equal to 35,000 lbs., which must be measured between the extreme limits of our strains, is perfectly in harmony with a perfect elasticity.

In a recent number of "Engineering," November 25th, 1887, I find that Prof. Bauschinger has made a series of experiments on the alteration of the elastic limit of iron and steel, extending over several years.

He concludes upon the point under discussion that "the elastic limit in tension is, in general, very different from that of the material when subjected to compression and artificially raising the elastic limit in tension, causes the limit in compression to be decreased, and this may even pass through the point of zero stress. In other words, a bar of steel or iron has two elastic limits, and whatever position these occupy on the scale of loads, the range between them is nearly a constant quantity. By alternately stretching a bar in tension and compression just beyond the elastic limits, these, after a certain number of repetitions, occupied positions equally distant from the point of zero load, and the limits thus obtained are called by Bauschinger the natural elastic limits of the bar. It was then noted that the stress corresponding to these limits sensibly coincided with that found by Wohler as the limiting stress to which a bar could be subjected to alternate tension and compression. It would thus appear that a bar will bear an indefinite number of repetitions of stress, provided the range of stress does not exceed the elastic range mentioned above."

This is a perfect confirmation of the views I have held for years, and is a satisfactory explanation of what is usually called the fatigue of metals.

Holding this belief, I do not think the compression at the bore plus the expected tension should exceed the elastic range of the material if the strains as determened by the ordinary formulæ are correct.

This would lead, I suppose, to a less initial compression at the bore, and also a less tension at the exterior.

And if the strains from temperature are considered, a still further reduction would be needed. For a lineal dilatation of .0012 for 180° Fah., and a modulus of elasticity of 30,000,000, each ten degrees of difference of temperature between the surface of the bore and the exterior, would cause a new strain of 2000 lbs. per □ inch additional difference of stratn between the interior and exterior.

How much such difference of temperature would amount to, I leave to those better able to judge, though I would expect it to be considerable in rapid firing of heavy guns.

I leave to those who are better posted in the application of the theoretical formulæ to determine in what manner these views may affect the design and construction of guns.

It is very doubtful to my mind whither the theoretical strains due to the hoop tension theory will obtain in practice. I should expect somewhat the same failure of correspondence between the theory and practice, as we find in the fibre stress of solid metal-beams under the analogous theory of elastic-beam flexure.

J. R. HASKELL, ESQ.:—Capt. Birnie, in his criticism on the multicharge gun, says: "Of the various experiments made, we have accounts of the performance of three guns only, *viz.*: a 2½-inch gun tested at the Washington Navy Yard, a 6-inch gun tested at Reading, Pa., in 1870, and the 6-inch gun which was tested at Sandy Hook." Capt. Birnie knows nothing about the many other experiments made with multicharge guns.

I commenced making and experimenting with these guns in connection with Mr. A. S. Lyman in 1855, and we worked in concert until 1863, since which time he has not been connected with it. He is now dead. These experiments have cost over

$300,000 of private capital, and have consumed years of time. I never asked a dollar of Government aid until I had demonstrated the success of the multicharge principle.

In 1857, through the friendship of Gen. Winfield Scott and at his request, I obtained permission to test a 2½-inch accelerating or multicharge gun (which I had constructed), at the Water Battery at West Point. In 1857 and 1858 I made many experiments there. I had previously experimented with guns of different calibers, and made on different plans, but all embracing the accelerating principle.

The first official test was made at Fortress Monroe, Va., in 1858, before a Board of Artillery officers, of which Col. H. Brown was President. I conducted all these experiments in person.

It was after this that the 2½-inch bore gun was made, which was tested at the Navy Yard, Washington, in 1863. Capt. Birnie says this gun "penetrated a target of wrought iron plates five inches thick, backed by eighteen inches of solid oak timber. This gave a penetration of 'more than two calibers.' The firing was done at 200 yards, with a total charge of 6¼ lbs. of powder and a steel projectile weighing 19¼ lbs."

Capt. Birnie does not state the whole case. This target had been fired at three times before by a 5-inch Whitworth gun, which was unable to penetrate entirely through the 5-inch iron plate, and the gun was cracked at the third discharge. The 2½-inch multicharge gun was then put at the same place. The first shot fired did not strike true, but "wabbled," the shot breaking and sticking in the iron plate. The second shot struck fair, penetrated entirely through the target and backing, making a hole of about its own diameter, and struck the water some distance in the rear.

Subsequently the same gun was tried against a target representing a section of the original monitor turret, made of the same kind of iron, and formed in the same machine as the original turret. The target was improperly supported so that it fell when struck by the shot, which "wabbled" some and did not strike fair. The shot was broken in the target, but "penetrated 7½ inches, cutting a hole 3 inches by 3¼ inches. The officer in charge admitted that if the shot had struck fair, and the target had been properly secured, the shot would have penetrated entirely through the target—ten inches. He, however, refused to allow another shot to be fired at it!

At that time no gun in the world could penetrate more than one caliber, and few could do that. Here was a gun which actually penetrated three calibers, and which it was admitted could penetrate four calibers. What encouragement did it receive? Why, the officer in charge (who was subsequently Chief of Ordnance of the Navy) reported the above facts, and then remarked "that he regarded the gun as more curious than useful, and recommended that no further experiments be made with it"!

The 6-inch multicharge gun tested before the Ordnance Board at Sandy Hook, was made of very poor metal, the cast-iron as well as the steel. The Board report "It is admitted that the 6-inch gun is made of inferior metal." The endurance of this gun would therefore be no criterion by which to judge the system. Besides, the gun was rifled on a very defective system, the same as that now used in the new steel guns of the Army and Navy. This system requires the use of either expanding or "slugging" projectiles, *i. e.* where the grooves and bands of the rifling are imprinted on soft metal bands at the instant of discharge. This kind of projectile creates unnecessary friction in the gun, helps to destroy it, and at the same time robs the shot of a great portion of its force.

I was forced to adopt this system, because I could not have the gun rifled as I desired by contract, and the treasurer of the company would not consent that any work should be done by the day. Had the gun been properly rifled it would have had much greater endurance in spite of the defective metal.

Capt. Birnie states that after the tube was cracked, "bands were shrunk on the chase of the gun, the only part where the form of the gun admitted the employment of this kind of strengthening."

The 2½-inch multicharge gun tested at Washington, had wrought-iron bands shrunk over the pockets while no bands were put on the chase. One of the forms of multicharge guns I have designed, has a central tube and the balance of the gun is all "built-up" by shrinking on bands. The built-up plan is, therefore, available for multicharge guns as well as for single-charge, and they can be made equally strong. I do not, however, approve of built-up guns. I have much better and stronger plans. I have made these guns in many different ways. Capt. Birnie has only seen one, and is not, therefore, competent to judge,

The enormous penetration accomplished by the ½-inch bore model I made, excites the attention of Capt. Birnie. That gun penetrated 10½ calibers in wrought-iron, and was not fully charged at that. The same gun can penetrate twelve calibers. It was made to prove that the multicharge system could be carried out to almost any extent. We do not propose to make large guns of as great relative power. If we did, a 12-inch gun would penetrate twelve feet of wrought-iron! That is more than is necessary, and the gun would be very long. We can, however, with guns of moderate length, penetrate four or five calibers, or double as much as any single-charge gun can do, and with less pressure.

The power developed by the 6-inch multicharge gun at Sandy Hook exceeded anything ever before accomplished by any gun of that caliber, and with less pressure, as the official reports show.

With a multicharge gun, the breech of which can be made of the same material, and as strong as any single-charge gun, the same charge of powder can be used in the breech if desired, and with the same effect. After that, additional charges can be added and much greater results achieved.

Capt. Birnie, on page 101, says the range of the 6-inch Navy gun is 3046 yards at an elevation of 3° 10′. The range of the 6-inch multicharge gun at Sandy Hook was 3000 yards at an elevation of 2° 55′, using much less pressure than the Naval Gun.

The range of the Krupp 11-inch gun at 4° 54′ was 4419 yards, weight of projectile 760 lbs., weight of powder 254 lbs. (See report "Board on Fortifications and other Defenses," page 45.) The range of the 6-inch multicharge gun at 4° 30′ elevation was 4480 yards. Sixty-one yards greater than the Krupp gun, with 24′ less elevation, and using a pressure of 10,000 pounds per square inch less than the Krupp gun.

Capt. Birnie closes his remarks as follows: "Most emphatically, then, a higher energy has not been obtained with this gun with its successive charges, and with moderate and safer pressures than can result from any gun of the same caliber using only one charge." That is the statement of Capt. Birnie who never witnessed an experiment with a multicharge gun. Against this I quote the statement of the Ordnance Board, composed of officers of the same Corps, outranking Capt. Birnie, and of much greater experience, who say in their official report on the multicharge gun trials: "There seems to be no doubt that a higher energy has been obtained with this gun with its successive charges and with moderate and safer pressure, than can result from any gun of the same caliber using only one charge."

(Signed,) T. G. BAYLOR, *Colonel of Ordnance, Pres't of Board.*
GEO. W. MCKEE, *Major of Ordnance.*
CHARLES SHALER, *Captain of Ordnance.*

For a more full and complete answer to all objections to the multicharge system, reference is made to a paper read before the "American Association for the Advancement of Science" on August 16, 1887, by J. R. Haskell, which has been printed in pamphlet form, and can be had free, on application to Mr. Haskell.

CAPTAIN CHARLES SHALER, ORDNANCE DEPARTMENT.—One point made in Captain Birnie's paper, cannot, I think, be too much dwelt upon.

Suppose that it is desirable to try a steel gun cast in a single piece, why should it be necessary to await the result of the trial before commencing to build guns equal to the best.

Nothing is more certainly proven with reference to guns, than that each caliber must be tried for each different mode of construction. The history of gun trials is full of accounts of structures which have answered for a certain caliber, and failed for a greater one.

If a six-inch steel gun cast in one piece prove suitable after fabrication and trial, it will teach us but little as to higher calibers. The larger gun must be made and tried before similar ones can be issued to the Service. All this requires in each case increased plant, and more time for experiment.

The most powerful pieces in existence, to-day, are without any question built up guns. A course of costly experimens extending through years has shown that for each caliber used, the method is good. We know that such guns can be constructed if we obtain steel possessing certain characteristics declared by those who wish to supply the material in this country, within limits that can be reached by them, because such material has been made in Germany, France and England. There is no peradventure about this, no careful passing from the known to the unknown, no questions of relying on the statement of an expert that he can do what has never yet been done, but certainly, because we may all possess a knowledge of what has already been done frequently. In other words, did the Government but possess the plant for fabrication, it could at once commence to supply an armament to defend the coast.

We do not know positively that a single cast-steel gun will answer the purpose. It may do so, and if we are to wait until guns are made of all the materials proposed, the coast will never be armed. Cast-steel made by the open hearth, Bessemer, crucible, or mitis processes has been advocated, so has aluminum bronze, so has a mixture of the cheapest kind of pig iron "refined" by adding proper proportions of copper, lead and mercury. Wire-winding is urged, and so year by year will other metals, and methods good, bad, and indifferent come up.

By all means let them be tried in some suitable way, but when we know to-day how to make guns equal to the best in existence, why continually delay their manufacture lest something else may prove better.

To do so is to imitate the poet's—"Fools waiting for certainty."

LIEUT. E. M. WEAVER, 2D ART.—The gun-*users* look at this question of gun-*making* with a little impatience.

The gun-makers in this country have been—as Captain Birnie's account shows—experimenting with this, that, and another gun-design for a score of years, working along cast-iron muzzle-loading lines, then cast-iron breech-loading lines, and have now settled down on what Captain Birnie regards as the ultimate stage of development, in so far as design is concerned, namely, the built-up forged-steel gun.

Captain Birnie's advocacy of the forged-steel gun is certainly as emphatic as it could well be; and, in view of the clouds—small as yet, to be sure—on the horizon of the forged-steel built-up gun, as represented by the cast-steel gun, and the use of aluminum-bronze as a gun metal, he is surely to be complimented on the frank manner in which he states his opinion, all the more so inasmuch as what he says will *per force* be accepted as the Ordnance view, notwithstanding the disclaimer in the preface.

The Artillery would be thankful if it could think that the end to temporizing in this matter had been reached; for if it ever come to be a fact, we may expect to have a few

first-class guns mounted ; but, on looking back, our confidence is impaired, for we recall the fact that there has, from time to time, if not always, been some "cock-sure" idea advocated, that has, in due course, retired before a new fancy.

During all this time the coast has been without protection from shelling, and the Artillery has not had a single breech-loader of larger caliber than a field-gun for practice purposes, notwithstanding the fact that there were good breech-loaders of all calibers needed for a secure defense of the coast *on the market*, and that there were several breech-loaders at Sandy Hook, idle, that had been sufficiently tested for drill purposes, if not for firing, that, considering their breech mechanism alone, would have been a blessing as an object-lesson to Artillerymen who have never seen a breech-loader as large as a siege-gun.

Captain Birnie places the responsibility for all this at the door of Congress ; but may it not be true that, if the Ordnance Department had been less interested in experiments, and more alive to what could have been had by other methods, Congress would have been more liberal?

It must be admitted that there has been no time within the period under consideration that we could not have *purchased* and mounted on our coasts guns that, for each epoch, would have protected our cities, and thus have given some return, in the form of insurance against loss of property, to the citizens who pay for the weapons. It seems to us the interests of the citizens of our sea-ports in this matter demands that we *first give them protection, from whatever source or by whatever methods it can be secured*, and then, after having accomplished this, we may legitimately experiment with a view to developing home gun-making.

On the basis of this home-manufacture policy, our sea-coast has been forced to await the development of the American idea in gun-making, which has been, in practice, the Ordnance idea. And what is the result : a servile adoption of European ideas that might have been accepted twelve years ago, as clearly set forth in Commander Simpson's report of his official visit to Europe.

The conditions are not different to-day. There are several gun-designs claiming attention, and our coasts are unprotected.

The guns we most need are those that will hold off the largest guns afloat to a point beyond shelling range from the city being defended. It is these large guns on our outside line of defense that will be needed within a hundred hours after a declaration of war. Such guns should have greater ballistic power than any gun that can be floated against them, and be able to pierce or shatter any armor that can be carried into our water-ways. *It is economy to mount the largest guns that can be secured*, for the larger the gun, the greater lead we shall have over armor in the pending race, and, by anticipating its development, our guns will be longer serviceable ; also, since the effective range of guns against armor increases very rapidly with increase of caliber, and the area guarded increases as the *square* of the effective range, larger guns mean *fewer* guns and *fewer* forts. Comparing, for the sake of illustration, a 20-inch with a 16-inch gun, the effective range of the former is seven times the latter ; the area guarded effectively, forty-nine times. It certainly does not cost forty-nine times as much to mount a 20-inch gun as a 16-inch gun.

The necessity of large guns has been made imperative by the present and prospective strength of steel and compound armor ; we believe that nothing below 1500 foot-tons projectile energy per ton of plate can with safety be assumed as a measure of plate strength for ballistic estimates.

It will be years before such guns can be supplied, if we depend on past methods. The only way, it seems to us, to secure a speedy defense of the coast on the outside line is to *open contracts to all reputable gun-makers of the world, regardless of design,*

provided a reasonable safety of gun is guaranteed, with modern mechanical appliances. It makes little difference to citizens and artillerists whether a gun is or is not a few pounds heavier or feet longer than another gun, if it gives *proper ballistic results.*

It would be a calamity, we believe, if, to arm our outside line, we should be forced to wait for the gun-makers of built-up forged-steel guns in this country to creep tentatively through the stages from the present 8-inch standard to those calibers absolutely necessary to defend our cities from shelling.

WILLIAM E. WOODBRIDGE, ESQ.:—I am compelled to say that the "built-up" gun finds more than a "rival" in the 9.2-inch Woolwich steel-wire gun, which has imparted to its projectile of 385.8 pounds, a velocity of 2560 feet per second. And this is not a finality in wire gun construction.

We need guns; and I would not, if I could, hinder the production of guns of the Vavasseur type. But we must not, for the sake of uniting in a voice of "no uncertain sound," conceal from ourselves the truth. While its structure is in great measure theoretically correct, the principles accepted point to a higher type. As yet practical proofs of the strength of the system are wanting. High pressures are studiously avoided. As yet, it must be said (I might quote good authority), "we are building our guns on hypotheses that have never been practically verified." Assembling the gun with the most correctly estimated shrinkages, and under the minutest inspection, does not so far test the soundness of the material, or its freedom from injurious initial strains, that it may not leave a hoop at the point of rupturing from its own tension, or a tube with an undetected flaw of any magnitude not apparent upon the surface.

It is impossible to make here the corrections, and, especially the additions to the statements of the paper concerning wire-guns which would be necessary to afford a basis for a full consideration of their merits. I add a few words, however. The 10-inch brazed wire-gun was not originally intended, or expected to be altogether suitable for a test, but, (as a 9-inch) was intended "to give the necessary experience to the workmen to construct the 12-inch gun determined on." ("Ordnance Report," 1872, p. 176.)

The powder used in the last three rounds was known to be of especial violence. In the words of the Board—"It burst into two parts just behind the trunnions, under a powder pressure of about 80,000 pounds to the square inch measured by the Rodman gauge." Nothing invalidated the indication of the gauge employed. The rupture was in a plane of imperfect brazing. It should be noted that the rear portion of the gun actually withstood the enormous pressure. The only possible question as to the strength of the system was that of complete brazing—all reasonable doubt of which was negatived by a study of the experiment itself.

When a "built-up" gun shall finish its career with an equal exhibition of strength, it will have acquired honors not yet won by any of the existing or departed.

As a correction of the views expressed on page 38, in the paragraph closing with lines in italics, I refer to the "Report of the Board on Heavy Ordnance," 1882, page 17.

I think it necessary to avow the opinion that questions of National armament, often as intricate as questions of law, may be better decided by a "full bench" than by a single judge, however competent and impartial.

No monopoly of qualification can be claimed for any department or profession. The author, who has made ample exhibition of his learning and acquaintance with the theories of Lamé and Clavarino, offers a convenient illustration of this statement, by an error which might be serious in practice, in treating theoretically of the increase of resistance derived from a lining-tube—on page 22. I can neither quote the text nor hint the correction here, but shall trust to the ability and candor of the author to make the correction.

I question whether the Army may prefer that the production of guns shall be wholly "entrusted to military men."

Benjamin Robins, "the father of scientiffc gunnery," was a civilian; so was Dr. Hutton, who followed up his work; and Count Rumford who investigated the force of gunpowder; so also the first to measure its actual pressure in guns; the inventor of the expanding projectile; Treadwell, Benjamin Chambers, Dr. Gatling Hotchkiss, Parsons, Vavasseur—a few from a long list.

In 1850, we had here the (actual) wire-gun—Treadwell's excellent guns—the expanding projectile, proved to be superior in accuracy to any cluster of shots recorded in the Ordnance Department, superior in penetration, exploding by percussion, and Chamber's slotted-screw fermature. There was needed not professional Ordnance skill to perfect them (that is not always its tendency)—but a competent tribunal to weigh their value. Such a tribunal, selected with the greater care, from military, naval, and civil life, would have been in the past, and I judge would in the future, be of the greatest service.

I take this opportunity to declare my high appreciation of the services of officers of the Ordnance Department, their ability and character.

CAPTAIN O. E. MICHAELIS, ORDNANCE DEPARTMENT.—Captain Birnie certainly merits our gratitude for doing so well what to him has been apparently a labor of love, presenting succinctly a resumé of Ordnance progress in the United States since 1840. His presentation is clear and unbiassed. His own decided predilections control only when bearing upon our latest official construction, the hooped steel-forged gun, and herein he certainly must be held excusable, for we may well say of him in connection with this gun, "*Quorum magna pars fui.*" The time limit assigned compels me to be brief, and hence my remarks can necessarily touch but few points, and must be in addition, merely suggestive.

I rejoice to see that Captain Birnie does tardy justice to that wonderful man, Daniel Treadwell. Some fifteen years ago I had the privilege of examining some of his unpublished work, and I felt then that he was certainly a quarter of a century in advance of his time, and that his name is worthy to be associated with the names of Bomford, Dahlgren and Rodman, great leaders of American Ordnance progress.

In discussing the subject of initial tension, the experiments of Mr. G. Leverich, M. Am. Society Civil Engineers, undertaken in 1875, while he was in charge of the construction of the Thompson gun, should not be forgotten. He was the first to examine the tensions of successive concentric rings from interior to exterior. His work will soon, I hope, be accessible to all interested.

The hooped forged steel gun, so far as military authority can make it so, is at present the adopted model, and it is the duty of all Navy and Army experts to do everything in their power to make it a practical success.

Still this sense of duty cannot affect the right of private judgment. Personally I do not believe in the French fermeture, the objections to it are well known and need not be iterated here.

Captain Birnie himself appears not to be its partisan, and I agree fully with him, that in the present state of onr metallurgical plants, it is the only feasible closure for the adopted model of gun.

Farther, I am an avowed, enthusiastic believer in the thorough trial of steel-cast guns. I recommended it nearly five years ago, and my belief in its feasibility has strengthened year by year.

Krupp is the *cheval de battaille* of the opposers to the Government trial of great steel-cast guns. His array of 21,000 successful guns is showered upon us, until we are apparently buried beyond possibility of exhumation.

The side that calls him must abide by the *whole* testimony of the witness—there is a well-known legal maxim that applies.

The hooped forged-steel guns of which there has recently been question with us, differ from Krupp guns in material, principle of construction, and breech mechanism, and when Krupp guns are cited in support of our present construction, I can, with equal logic, cite, in support of my views, the thousands and thousands of successful cast guns.

Krupp uses crucible steel, at present, awaiting the impending improvements in the open-hearth process, the only trustworthy homogeneous steel made—a result due to the crucibles being solely a melting pot, and not a refining apparatus. Krupp does not make a *hooped* forged gun—in our sense—he makes *mantle* or *jacket* guns. His underlying principle is the entire removal of longitudinal strain from the gun tube. His field-guns consist of but two parts, the tube and the mantle, which carries trunnions and fermature. His latest constructions, the 40-centimetre monsters, are also *mantled* and *not* hooped. Krupp uses the wedge as a closure carried independently of the gun body—we, the screw necessarily seated, directly or indirectly, in the body.

The Krupp ingots for the 16-inch gun bodies weighed over seventy tons each—pretty fair-sized guns to start with.

I do not hesitate to announce my belief that the *main beneficial* effects of hammering such a mass of steel lie in *shaping* the metal. I further believe that whatever supposed improvement may be brought about in its physical condition under hammering is due to successive heating and reheating. I am fully convinced that steel can acquire all its mechanical properties without hammering, and that in the near future we shall see both hammer and press used simply as economical shapers.

I cannot understand why there should be such opposition to the thorough trial of steel-cast guns. Dahlgren, Rodman, and Woodbridge guns have been tried at Government expense—why not then steel-cast guns—every step in whose fabrication, whatever be the outcome, would add invaluable knowledge to our metallurgical manipulations.

We are not without justifying data for our hopes of success. Steel is a curious alloy—every day developes new features in production and behavior. *All* cast guns have been successfully made and tested in Sweden. An 8.4 cent. gun, Krupp model, tube and jacket, both cast, has been fired over 2,000 rounds with charges weighing three and one-third pounds, and projectiles fourteen and three-quarter pounds, and not the slightest enlargement of chamber is perceptible. The metal was thirty-eight carbon, with an elastic limit and ultimate tenacity for the mantle, of 53,700 and 100,200, for the tube, 73,500 and 121,000. Which shows that by proper treatment cast specimens can be made to indicate any desired physical properties.

I fear I have already exceeded my time, and will therefore stop, merely iterating the wish that the authorities would lead this investigation of the practicability of casting steel guns, an investigation that would in no wise antagonize any present plans of gun construction, an investigation that would be of incalculable advantage to what promises to be the wide spread art of steel founding.

R. H. THURSTON, ESQ.—I do not think that I can add anything valuable to the mass of facts presented by Captain Birnie. It is a paper of such unusual extent and richness that it could hardly be expected that any engineer, not a specialist in that field, should be able to offer more than confirmatory sentiments in such parts of the subject he might be somewhat familiar with.

The necessity of instant action, and that on an enormous scale, in view of the exceedingly critical position to which the blindness of the General Government has reduced us, must, as it seems to me, be obvious to the most thoughtless and least patriotic of

our citizens. I am not sure that it can be said just where all the responsibility lies, but I presume that it is mainly with the Appropriation Committees of Congress, and especially in the House of Representatives. However, that is not the vital matter at the moment; the first thing to be done is to render the nation safe against foreign foes at the earliest possible instant; and it seems tolerably evident that much must be done in educating our representative bodies up to a point from which they may be able to form some faint idea of the dangers to which they have exposed, and to which they are still exposing, their country. Once Congress is fully aware of the situation, it is probable that less will be said of a visionary "surplus" in the Treasuary, and more of its expenditure in directions in which it, and more, should long ago have been placed—coast defense, Army and Navy material, and interior and frontier improvements. Should the business men of the country ever take active part in matters of national importance, and work hand-in-hand with the legislative bodies and with their natural advisers of the two branches of the Service, we may cease to apprehend such dangers as now threaten us; but I fear not until then. It is at least a source of some comfort to find that our officers, in Army and Navy, are doing their part, however much our legislators may neglect their highest duty.

I find myself greatly interested in the paper under discussion, both as giving valuable and, often, new information, and as representing the views of experienced and thinking officers in regard to the best materials and constructions of modern heavy guns. While recognizing the difficulties involved, and the comparative imperfection of the familiar processes and apparatus used in the manufacture of large masses in steel, I have always had a strong conviction that that metal would completely displace iron in all ordnance, as well as in nearly all constructions of other sorts; and, further, that ways would sooner or later be found to handle it in the largest masses that might be called for, and to give it its highest qualities whatever their magnitude. We evidently are still a long way from the ideal state of the art to which we aspire; but we are as evidently making continuous and somewhat rapid progress. The built-up gun must obviously precede the solid, in heavy ordnance; and the approach to the ideal construction seems to me, in the light of existing knowledge and experience, to be likely to come rather through the gradual increase in size, and decrease in number of parts, of the built-up gun, than through the—in some respects—opposite course illustrated by Treadwell and Woodbridge. It would, however, be folly to dogmatize in that, as in any other matter of engineering. The built-up gun is certainly, to-day, the representative of the highest modern art in ordnance construction. The introduction of oil-hardening and tempering is an enormous step in advance; and the systematic ways now in vogue of testing, experimenting, and scientifically determining the quality of the metal, as variously treated, and of ascertaining the line in which further progress must be made, are sure to give us safe and sure guidance. The history of this progress, as presented by Captain Birnie, is an exceedingly interesting one, valuable not only as a record of the past, but as guide for the future. In the light of these systematically collected and arranged masses of knowledge, such as are here illustrated, it is to be hoped and fully expected that we may, in time, come to the construction of the heaviest of ordnance in single masses, or in few pieces, in such manner as to bring out the very highest possible qualities of metal, in the best possible gun.

I have no doubt that the same succession of replacements of one construction by another, which has sent the old Rodman cast-iron gun into limbo, and has already sent the wrought-iron built-up gun after it, will, in time, dispose of the steel built-up gun in precisely the same manner; but there is, at the same time, no doubt, to my mind, that, for heavy ordnance, such as we are now accustomed to see adopted for the more important coast defenses and heavier iron-clads of the day, the steel built-up forged gun rep-

resents the best existing system. I agree heartily with the writer of the paper, as must every good citizen, that the industry of making such guns should be fostered in this country, even at the expense of large sacrifices by our taxpayers. This is a matter of simple self-protection and insurance. One of the great dangers constantly threatening our nation is that which comes of its persistent and criminal neglect to take the most ordinary of precautions in self-protection against foreign possible enemies among nations which have no such commercial interests to guarantee a peaceful disposition, as has, for example, our own mother country Once we have the material required for the manufacture of good guns, and establishments capable of turning them out in large numbers, we have improved our chances of preserving the peace and of securing respectful consideration of our rights and interests, on the part of other nations, enormously. It will probably be admitted on all sides that the United States Government is not called upon, by motives of either Statecraft, business, or simple, wise provision of possible disputes with other nations, to do more than to institute effective means of self-defense; but it is probably quite as generally recognized as the part of wisdom to make our defenses against any possible foreign aggression as absolutely safe as our knowledge, skill, and wealth, will allow. In this, as in most matters of business, the best preparation and the best material are the cheapest in the end.

Finally: in regard to the Treadwell and other systems of wire-wound guns, it may be said that, while their theory is unquestionably in many respects correct and somewhat promising, we have, so far as I am aware, no evidence indicating that the universally recognized practical difficulties to be overcome in their manufacture and use are likely soon to be satisfactorily disposed of. As to steel-cast guns: I have no doubt that they will come into use; but it will be first necessary to insure that they do not represent the conditions enunciated by Captain Birnie, and their advocates must be able to do more than assert that "steel in a relatively weak condition is abundantly strong for the work required of a gun." We—for, with this qualification, I am one of those advocates—must first find means of securing greater resilience of mass, per pound weight, in that gun than in the built-up gun. I think that, in time, the Whitworth and Dean, or other processes, or combination of processes, will bring about this desirable state of the art of great gun manufacture. With regard to the metal: it may be said that no form of iron, steel or other metal is "strong enough" and tough enough for ordnance, if we can, by any possibility, find another which is, in the mass, stronger, whatever the material and however put together. A nation on the defensive may not need many guns; but that is all the better reason for insisting that those which are supplied shall be the representatives of the highest skill the world can offer.

It is a singular fact that, while nearly every great inventor, in this field, is an American, trained in the school of the American mechanic and encouraged by the grandly successful patent system of this country, they are all, invariably, compelled to seek the reward of their industry, skill, ingenuity and persistence, among the nations of Europe, and among peoples who have never known the advantages of this form of protection of home industry. It is to be hoped by every good citizen that, after a time, when the National Legislature shall have awakened from its Rip Van Winkle slumber—if, meantime, some powerful foe has not demolished out mock defenses and, like Prussia after the last Franco-German war, inflicted a fine that shall cripple us completely—our inventors and our long-suffering Army and Navy officers may see some slight attempt made to at once secure for the country an insurance against such dangers, and a reward for their patriotic and earnest endeavors.

JAMES E. HOWARD, ESQ., WATERTOWN ARSENAL.—In the construction of modern forged steel guns, a superior metal is employed which combines high elastic prop-

erties, and tensile strength, with a very considerable amount of toughness, together with homogeneity and soundness of structure.

This gun-steel occupies an intermediate position in degree of hardness between the mild structural steels, and the higher grades of spring and tool steels. Very elaborate tests of quality here have been made which serve to establish its reliability and the thorough method of inspection employed identifies and secures the acceptance of metal of the high standard of excellence which has been attained. The requirements of a gun metal are necessarily severe, a certain strength it must have, and it should have ample strength to compete on even terms with any weapons which may be encountered; in other words only the best metal for the purpose should be employed.

The metal adopted in the construction of modern forged-steel guns seems to possess in the aggregate, the greatest number of desirable qualities now attainable.

To review briefly the physical properties, mild steels approach in qualities the best grades of refined wrought iron, they are low in elastic limit and tensile strength, but possess great toughness as shown by the elongation of the metal before rupture, and by its contraction in area at the place of rupture.

Manipulation, cold, will elevate the elastic limit and tensile strength, but at the same time detracts from its toughness.

This method of increasing its resistance is limited in its application, practically, to a number of simpler forms into which the metal may be put.

Mild steel is slightly affected, comparatively, by surface defects of limited extent, such as indentations from hammer blows or cutting tools and the like, the relative influence of such defects increasing in serious importance with the increase in hardness of the steel.

The relative deleterious effects of interior defects of structure, such as may exist, in different grades of metal are very difficult of ascertainment, such information coming incidentally with a large experience in working the several metals under a variety of circumstances. This much may be said, however, that instances have been met wherein the very softest steels have suddenly fractured with a display of brittleness unsurpassed by the higher grades of steel. No steel, which has been improperly treated, seems to be exempt from this behavior, and investigations have shown pretty clearly what is proper and what is improper treatment. These remarks have reference to the mechanical treatment of steel apart from questions of chemical composition. As we advance to the higher grades of metal, higher elastic limits and tensile strength are found with less elongation and contraction of area.

Gun steel is characterized by its high elastic limit, and tensile strength combined with an extraordinary degree of toughness.

The modulus of elasticity has been found to remain substantially the same in steels extending over a wide range in chemical composition and not to be sensibly different in tempered and annealed bars, hot-rolled and cold-rolled bars.

A reduction in the modulus of elasticity follows over straining, but this has been found transitory in all specimens thus far examined.

Under higher temperatures there is a reduction in the modulus of elasticity, the reduction going on as the temperature increases, the practical effect of which in a gun would seem to be the introduction of the principle of "varying elasticity," while the gun had a temperature at the bore higher than at the exterior.

While the elastic limit is lower than at atmospheric temperatures, yet the tensile strength, after showing a slight reduction in the vicinity of 250 degrees Fahr., increases from this temperature, or thereabouts, until at 500° to 600° Fahr. the increase in strength amounts to from 15 to 20 per cent. of its strength cold.

It has been further observed that bars which have been strained while at these

higher temperatures by loads in excess of the strength cold, were not thereby weakened when afterward tested to rupture at atmospheric temperatures, but, on the other hand, were found to retain the strength due to the high temperatures at which they had previously been strained.

The co-efficient of expansion by heat appears to be influenced by the chemical composition of the steel.

A series of observations made on steel bars, ranging in carbon from .10 per cent. to 1.00 per cent., the other elements present, not varying in regular succession, showed a progressive reduction in the co-efficient of expansion as the percentage of carbon increased.

The mild steels showing about the same rate of expansion as wrought-iron, the hard steels not reaching quite so low a co-efficient as that of cast-iron, but cast-iron contains a much larger amount of carbon than the highest steels experimented upon.

Internal strains may exist in steels and other metals. They are an advantage in guns when disposed according to certain laws governing the resistance of cylinders.

When they exist locally and of great intensity they become correspondingly disadvantageous, and may cause unexpected fracture of the metal.

The intensity of such strains is limited by the elastic limit of the metal, and treatment that elevates the elastic limit thereby increases the capacity for receiving internal strains.

The introduction of internal strains in well-annealed metal depends upon, at least in a measure, changes in density, and to effect a permanent change of density by cold treatment necessitates a permanent set or flow of the metal; from which it follows that the higher the elastic limit, the more difficult will it be to introduce internal strains by the application of external stresses.

The advantages which high grades of steel possess in the direction just referred to are not known to be offset by counter disadvantages resulting from moderate changes in temperature.

COMMANDER R. D. EVANS, U. S. NAVY.—One can only speak in terms of the highest praise of this excellent article, and had I the time to do so, I would like to place myself properly on record with reference to the matter of "steel-cast" guns. I have for many years advocated the steel-cast gun, and firmly believe that it will prove the gun of the future—but, at the same time, I would not, in any way, interfere with, or defer the making of built-up guns, which we have reason to know are good. There seems to me to be ample room for both systems, and I hope the great industry of steel-casting may have proper encouragement.

CAPTAIN JOHN G. BUTLER, ORDNANCE DEPT.—As it is perhaps true that, after Mr. Wm. P. Hunt, I am chiefly responsible for the existence of the 12-inch breech-loading gun at Sandy Hook, it may follow that I am qualified to speak upon that part of Captain Birnie's able paper devoted to cast-iron guns. But since the practical attainment of my own wishes in the successful efforts of Mr. Hunt before the Logan Committee, it has been rather as "a looker-on in Vienna" that I have interested myself in the gun question, and I am somewhat averse to entering the arena of discussion; nevertheless, as I think that the prejudices of the author of "*Gun-Making*" have stood a little in his way as a fair historian, I will undertake to correct two or three of his statements, although I fear that it will be impossible to confine my remarks within the limits which you find it necessary to assign to the discussion.

Captain Birnie is certainly the first ordnance officer who ever found anything to admire in the report of the Select Committee on Ordnance, 1869. This committee announced a number of conclusions. Among them was one condemning the Rodman, Dahlgren and Parrott "systems" as applied to rifles, and this he considers so power-

ful a backing to his argument that he exults over it more than once, and overlooks another conclusion of the committee condemning all European "systems" as showing "no exemption from the rule of failure," and discountenancing their trial in this country. The committee in no place condemned cast-iron or cast iron guns *per se*, as Captain Birnie seems to think, but its report was made to do duty last winter in parading, before Senators and Representatives, lists of Rodman, Dahlgren and Parrott rifles which had failed, carefully suppressing the fine records of many of these guns and making no mention of well-known causes of failure in others.

The argument for the fair trial of strong cast-iron as a material for heavy rifles was largely based upon the admirable performance of many cast-iron guns and the brutal treatment, by vicious systems of projectiles and rifling, which seemed to justify the failure of others. It has, perhaps, "suited the interests" of the friends of cast-iron to call attention to its record, just as it now appears to "suit the interests" of Captain Birnie to discredit that record and place his individual opinion against the judgment of men who formed theirs at the proof butts. Many officers of distinction witnessed these experiments more than twenty years ago, while the author of "*Gun-Making*" was employed elsewhere. The enormous strains to which the guns of that day were subjected were not theoretical, the facts were there for observation. The then Chief of Ordnance, General Dyer, fifteen years ago ordered a discontinuance of his own soft-base projectile and directed the use of the Butler projectile in experiments with powder then going on. Krupp shortly after abandoned his lead-jacketed projectiles, eccentric chamber and narrowing grooves—a system which had hitherto restricted his guns to the use of comparatively light charges—and adopted the copper-banded projectile—and lo! the result at Meppen in 1878. The English about the same time abandoned their studded projectiles and took up the expanding system for their muzzle-loaders, and it is a perfectly noteworthy fact that from the adoption of reliable muzzle-loading and breech-loading projectiles it has all been smooth sailing for the development of guns and powders, the pressures having been brought practically under control.

Captain Birnie is not more fortunate, I think, in ascribing the heavy pressures formerly recorded to "defective means of measurement" or inexperience with the Rodman Gauge. The exterior gauge was rarely used; the interior gauge had been used for years; the same officer (Colonel Baylor), who used it at Fort Monroe, afterwards used it for years at Sandy Hook, and his experience with this gauge and various ballistic instruments was larger than that of any officer in this or perhaps any Service. Again, the very same employè—Hickey—who had prepared the gauge for years at Fort Monroe, both for Army and Navy experiments, was afterward employed at Sandy Hook in setting up the same instrument, and is probably thus employed at the present time. In regard to the few indications of pressure supposed to exceed that due to the explosion of gunpowder when confined within its own volume, it is possible that when this high limit has been approximated in the gun, intense local action has interfered with the normal action of the gauge.

I think I must mention one instance of Captain Birnie's inconsistency in his opinion that the "true reason" for the bursting of cast-iron guns was "the frailty of the guns themselves," and in his emphatic "opinion" that bad projectiles and rifling had little to do with it. I refer to his own citation of experiments at Nut Island with 15-inch guns rifled with two grooves. He says: "As an illustration of what *cast-iron rifles** will stand when *badly treated* (thereby implying that they had not heretofore been "badly treated") we may extract the *four guns of this class** (conveying the impres-

* Italics marked are mine.

sion that they were "cast-iron rifles" in an ordinary sense) which were included in Wiard's somewhat notorious experiments at Nut Island in 1873–75," and he then cites these so-called "rifles" which burst at the 19th, 2d and 7th rounds respectively, with charges of from 100 to 140 pounds of powder. Now, if the Wiard projectiles did not burst these guns, how is their failure at the very outset of the firing to be accounted for, in view of what Captain Birnie calls elsewhere "the present efficiency of the 15-inch guns with increased charges"? If, on the other hand, the projectiles *did* burst the guns (if I may venture upon so rash an hypothesis) his citation is inconsistent with the position which he has chosen to take on the question. Even his qualifying admission that "The Wiard rifles are generally admitted to have been destroyed by excessive charges and bad projectiles" he cannot bear to let stand, and therefore adds: "Yet the charges he used bear no comparison with those now required to be used in steel guns." Very true, neither in quantity, which he refers to, nor in *quality*, which he does not. Nor do they bear comparison with the 265-pound charges of the 12-inch cast-iron rifle; but how much over 100 pounds of powder, bottled up in the bore, or operating behind a projectile which acts as a wedge, does Captain Birnie consider necessary to burst a gun?

The concluding paragraph of the chapter on the cast-iron rifle touches me personally, and not very generously, and as the statements are entirely erroneous and have appeared in newspapers, it is perhaps as well to at least notice them. The paragraph covers a considerable portion of the history of the case, and I beg to quote it entire:

"The ability which the officers of the Ordnance Department have shown in designing so powerful a cast-iron rifle as the one lately proved is an earnest of their desire and capacity to carry out whatever Congress may direct. Had the 12-inch cast-iron rifle been made after a design presented to the Logan Committee, that was, to fire 150 pounds of powder with 700-pound shot, and give a muzzle energy of but 10,000 foot-tons, instead of the 17,000 foot-tons procured in the design actually used—but little interest would attach to a discussion of its merits here or elsewhere."

Briefly, and perhaps flatly, I will say that I designed this and other of Mr. Hunt's guns which were before the committee, and that the design has been adhered to in good faith by the Chief of Ordnance. In the light of many months' later experience a few changes were made by the Ordnance Office, with this difference in our judgment: that, whereas, the only change of moment (enlarging the chamber) which was made *before* initial proof I would have made *later on*, and did anticipate and provide for three years previously.

I first urged for the trial of a 12-inch cast-iron rifle about fifteen years ago, before the Heavy Gun Board of 1872, and on subsequent occasions have continued to argue that such a gun should be tested under the modern conditions of improved powder and projectiles. In 1881 my friend Mr. Hunt and myself, being nearly of one mind on the subject, I assisted him in the preparation of his case for presentation to the Getty Board upon two conditions, namely: That he should make no acknowledgment of my services (for one reason, that I did not wish to appear before any committees), and that I should receive no pecuniary compensation from his company. He urged before that Board a 12-inch breech-loading, cast-iron rifle ("D") to be tested in comparison with the four 12-inch B. L. rifles then under contract for the Government but subsequently abandoned. Following this design ("D") were two other ("E") and ("F") exactly similar in outline and dimensions to the cast-iron rifle, but differing from each other, in that one was lined with a short steel tube and the other was hooped with steel. This Gun Board of 1881-2—with the exception of the two Ordnance officers—became badly afflicted with the steel-wire craze, and its report was not fully concurred in. The Logan Committee was appointed, and before it Mr. Hunt and others

laid their plans. The cast-iron rifles designs "*D*" and "*F*" were to be cast breech up, for reasons given; they had the Rodman contour as far as the breech, a slight portion of which only was cylindrical so as to conform to that outline which was most economical and convenient for the hooped gun "*F*." A few inches of taper on the base of design "D"—a question of taste, not utility—gives the curve of the gun at Sandy Hook. In all designs for cast-iron guns, whether entirely of that metal or steel-hooped, I introduced the feature of a *steel sleeve* or *housing* for the slotted screw breech-block, so as to avoid cutting away half of the cast-iron thread, a feature which has been retained. The character of the pitch was that which I had urged for many years, now widely adopted, *i. e.*, an increasing pitch in which the angle at the breech bears a reasonable relation to that at the muzzle. I provided for fewer grooves and an expanding projectile, because at the time it was thought easier on the gun. The character of the rifling was otherwise practically retained, the angle being slightly changed, but as three or four feet were added to the muzzle—which Mr. Hunt would probably have added without suggestion—I suppose that this little end of the gun was not considered Mr. Hunt's property, and so in it there is a sudden return to the old love and the pitch made uniform for about three feet.

The test of these guns was especially urged (Pages viii., 79, 80, Hunt) as serving to determine: 1. Whether a serviceable heavy breech-loading rifle could be made of cast-iron pure and simple. 2. The extent to which steel as an auxiliary might be beneficial. 3. Whether it would be better to apply the steel inside as a tube or outside as a jacket—the latter plan being the more expensive. The report of the Logan Committee was concurred in by Congress, and among the guns appropriated for were two cast-iron 12-inch breech-loading rifles and one cast-iron rifle banded or hooped with steel. As these guns had been urged, I believe, by Mr. Hunt alone—the Ordnance Office favoring only the all-steel and the French systems—it was considered that the three guns thus designated meant Mr. Hunt's, and as it was thought that the committee had intended to add the words "one to be lined with a steel tube," after the words two 12-inch cast-iron rifles, etc.," Mr. Hunt suggested and obtained authority to put a steel tube in one of them. I have seen this circumstance referred to as though it marked some lack of confidence on Mr. Hunt's part in the cast-iron gun, and therefore deem it proper to say that he made the request at my written solicitation. The argument for the test of the *series* of guns, ("D" cast-iron "E"—cast-iron lined, "F" cast-iron banded) was logically sound; my own arguments on professional grounds fitted into his from a manufacturer's standpoint; we had worked hard to get the guns and succeeded. I believe that on his own account Mr. Hunt would have preferred the two cast-iron guns intact, but he cheerfully made the concession to me.

This gun was not originally designed to fire "but 150 pounds of powder." Mr. Hunt was willing to guarantee such a charge, or 10,000 foot-tons energy, and this being at the time well up to the standard for *service* guns of like caliber abroad, he argued that the proof of the gun should be *commenced* with that charge. But the identical figures, 17,000 foot-tons, which Captain Birnie now gives great credit for in another quarter, was provided for as a contingent proof for this gun as far back as July, 1881. (Page 33, Hunt.) True, the charge of 225 pounds of powder then provided for might not have quite accomplished this result, but it was never pretended to accurately determine the *chambers* of any of the guns until working-drawings were required, and it was a year or two after the appropriation for this rifle, and *three* years after the charge of 225 pounds was suggested to the Getty Board that the dimensions of the chamber were finally fixed. This hardly constituted a "design," and it will also be admitted, perhaps, that adding a little to the muzzle of a gun *originating with and produced by others*, or making it exactly of ½-inch greater semi-diameter at the

breech, or adopting a slight change, or, in fact, any change of rifling, is not designing a gun in any rational sense. Furthermore, I claim that these changes were not dictated by the best judgment. Mr. Hunt's programme was to begin proof with charges giving say 10,000 foot-tons energy, which, if sustained up to a certain number of rounds (one hundred rounds were *guaranteed*), would by our agreement, which appeared to satisfy the committee, justify the construction of this cheap gun. After this the chamber would have been reamed up to hold the 225 pounds specified, and after further proof we could ultimately reach 270 pounds, and perhaps 300 pounds of powder and 800-pound shot, with which charge the proof could have been continued. This would have left the chamber in perfect condition for the heavier charges. It was not a well-ordered experiment to jump at once for the maximum effect. What was wanted was the true measure of the gun's strength or weakness, and this would not give it; our programme would have developed the same power, but I think more wisely, and the proof of the gun would have been further and more intelligently advanced. I think, therefore, that Captain Birnie is mistaken in claiming for "the officers of the Ordnance Department"—whether this means himself or coadjutors—any credit for "designing" what he is pleased to call "so powerful a cast-iron rifle as the one lately proved." One would suppose that he would hesitate before putting himself or friends into the peculiar position of first energetically opposing the construction of a gun and afterwards claiming credit for all there was in it. Mr. Hunt, as the manufacturer, and I as the designer, and both of us as the originators of the 12-inch breech-loading cast-iron rifle, have to thank the Messrs. Du Pont for an excellent powder, and there our obligation ends.

Another important contingency was provided for in connection with heavy cast-iron guns. The admirable conservation of the bores of cast-iron rifles had been observed, but with improvement in gun-powders the tendency would be to increase of charge and weight of shot, and under the longer sustained heat and action of the powder gases it was possible that the surface of the chamber and of its junction with the bore might need protection. I therefore revived an idea which occurred to me several years previously at Fort Monroe, upon examining the bottom of the bore of a gun which had been fired many times, and suggested—as referred to in Mr. Hunt's letters to the Getty Board, page 49—a chamber-lining of thin steel or copper, which would be removable at pleasure. I think the chamber of the 12-inch gun should now be reamed up and this thin steel-lining tube inserted. It has nothing to do with the strength of the structure, and is now thought advisable, I believe, in heavy steel guns. Had the chamber of this gun been made smaller in the first place, a beautiful new surface could have been presented for every one or two hundred rounds of increasiug proof charges.

For the rest although I believe that the character of many of our harbors, and the enormous extent of our coast, combined with our grievous necessities, should long since have prompted the definite settlement of the question how far cast-iron may be available for heavy coast guns, yet I am in hearty accord with all efforts looking to the development of gun-steel industries, and to the highest type of the steel gun. Captain Birnie presents one of the ablest arguments in this direction that has come to my notice, and although much that he says is already familiar to Ordnance Officers—in part by his own excellent professional work—yet I have read his paper with fresh interest and profit. Nor is any apology necessary, in my opinion, for past failures; the Government is rich enough to support experiment. The material is here, and, if it needs improvement, the metal-workers are here to accomplish it. The mechanical part of the problem is small, the "designing" is still less; the metallurgist will create the "gun of the future." But I believe that a "high-power gun" should mean a *high-*

pressure gun (the variety of our powders is becoming too complicated). We do not want a tube as long as the moral law begging for easy treatment by the powder, but a shorter, more compact, and more convenient weapon. "High-power ammunition" would be a much more appropriate expression at the present time, for, to the powder manufacturer is really due most of the credit now so complacently absorbed by the gun exponents. Rodman is occasianally named as a man well enough in his day, but I rarely see the name of Du Pont mentioned.

LIEUT. WILLIAM CROZIER, ORDNANCE DEPT.—Progress is the movement in the mechanical arts, traveling the parallel roads of increased economy and increased efficiency.

A fixed belief in the excellence and serviceability of a type of mechanical construction, while supplying the confidence necessary for engaging in its extensive reproduction, is not incompatible with investigation as to the lines of possible improvement.

The lecturer has stated his appreciation of this fact, and while urging the manufacture of the built-up forged-steel gun, a satisfactory and now undoubtedly the best type, has had a not discouraging word for the two most prominent attempted improvements under trial, *viz.*: the steel-cast gun and the wire gun. With reference to the former he has indicated very clearly the requirements, the difficulty of attaining them and the results of falling short of them. I will call attention only to the fact that the progress attempted to be realized in this effort is in the direction of economy only, the less important of the two roads; and that, as far as efficiency is concerned, its advocates, while claiming in general terms that it will be as great as in the built-up guns, practically concede in their specifications that it will be less; making, therefore, a step backward in this direction.

The almost universal law of progress is that it is from the simple to the complex; improvement in material and combination overcoming the disadvantage of complexity, and increased expense being more than compensated for by increased efficiency. A return to simplicity for simplicity's sake at a sacrifice of efficiency is rare indeed in the arts.

I will now try to indicate briefly what constitutes the promise of the wire gun, what are the difficulties in the way of the fulfilment of the promise, and what the probable lines along which the difficulties may be overcome. The main object sought to be attained in wire guns is great tangential resistance without corresponding sacrifice in other directions. The desirability of this object may be explained as follows:

MM. Sebert and Hugoniot have established for the pressure on the base of the projectile the formula

$$P = P_0 \frac{W^*}{W + \frac{C}{2}}$$

in which P_0 is the pressure at the breech, W is the weight of the projectile, and C that of the charge. The energy of the projectile is

$$\frac{Wv^2}{2g} = \int P dx = \frac{W}{W + \frac{C}{2}} \int P_0 dx.$$

If we take the axis of the piece as the axis of abscissas and plat the pressure curve the expression $\rho P_0 dx$ will represent the area under this curve, to which area, therefore, the energy of the projectile is proportional.

If the strength of the gun permitted the use of a kind of powder or method of forcing for the projectile (or both) such that the combustion of the charge should be completed before the movement of the projectile commenced, the pressure with the stated

* Etude des Effects de la Poudre, by H. Sebert, Lieut.-Col. de l'art de la Marine et Hugoniot, Capitaine de l'art de la Marine.

charge of 100 pounds and density of loading .9, would rise at once to 33.6 tons and fall off to 4 tons at the muzzle, instead of rising to 16 tons after a movement of one and one-half calibers and falling to 2.9 tons, as indicated in the plate accompanying the lecturer's paper. The area under the pressure curve would be increased about one-third, which represents the proportion of gain. But with sufficient strength we are not limited to the use of a charge of 100 pounds and density of loading .9. There can be put into the chamber of the 8-inch B. L. steel rifle a quantity of powder sufficient to give a density of loading about 1.15, with which charge and the condition of complete combustion before movement, the pressure would rise to about 45 tons and drop to 5.34 tons at the muzzle.* More than doubling the area under the pressure curve. Hence the energy imparted to the projectile would be more than double that under present conditions. The weight of the projectile remaining the same the velocity would be increased to one and one-half times the present, or to 2,737 feet per second.

The gain from increased strength of construction is apparent. These conditions can probably never be fully attained in practice, but subdivision of the grains and the law that the rate of combustion is proportional to the pressure, together with our ability to increase the severity of the forcing, are means by which we can reach a very close approximation to them. That severity of forcing increases, and does not diminish, as has been stated, the energy of the projectile, is not only apparent from theoretical considerations, but has been proved by experiments made with that object by Messrs. Noble and Abel, and by MM. Sebert and Hugoniot.

Other considerations than that of tangential resistance of course enter, such as erosion, limiting the useful pressure. I am only endeavoring to indicate the limit towards which we may strive.

The difficulty of longitudinal resistance in wire guns is one with which all are familiar. Various methods have been devised for overcoming it. They can be divided into three general classes: those which place the resisting member within the wire coil; those which place it without; and that of Dr. Woodbridge, which brazes the wire coil into a solid mass.

But the difficulties of attaining, even theoretically, the high tangenital resistance claimed by most of its advocates for the wire construction is not so generally understood. Misapprehension upon this point has been fostered by the assumption of unattained and unattainable values for the physical constants in cast-iron and steel,* and by

* I do not refer to the elastic limit of the steel wire, that has been generally understated.

their declining to be governed by the rule, so strictly observed by the designers of built-up guns, that no part of the structure shall be strained beyond the elastic limit of its material either at rest or under fire.

If the tube, which necessarily forms the core in all systems of wire construction, is to be subjected to this law, then a wire gun can, in general, be made no stronger than a built-up one of the same thickness. For the formula $P_0 = \frac{3(R_1^2-R_0^2)}{4R_1^2+2R_0^2}(\rho+\theta)$ (see page 111 of the printed lecture), giving, as it does, the admissible powder pressure, under the supposition that the metal at the surface of the bore undergoes a range of dilation from the elastic limit of tangential compression at rest to that of tangential extension under fire, applies equally to built-up and to wire guns.

* The pressures are computed by the formula of Messrs. Noble and Abel.

$$P_0 = 43\left(\frac{.43}{v-.57}\right)^{1.057}$$

in which P_0 is the pressure per square inch and v is the ratio of the volume occupied by a weight of water equaling that of the charge to the volume occupied by the products of combustion.

Researches on Explosives by Captain Noble and F. A. Abel, No. II.

We must disabuse our minds of the error, likely to find hasty lodgment there, that the wire affords a more rigid support to the tube than surrounding parts of forged steel do. The rigidity of this support depends upon the modulus of elasticity of the supporting material, and that for steel wire is no greater than for forged steel.

The wire used in the construction of the guns at the Watertown Arsenal had about 2,000,000 pounds less modulus than the forged steel used in gun construction, although this wire had an elastic limit of 100,000 pounds and a tensile strength of 170,000 pounds per square inch.

The extreme range of the metal of the bore being obtainable in a built-up gun of four concentric cylinders, we can go no farther either by greater subdivision or by increased strength of surrounding parts. The limit of the play of the tube prevents the utilization of the great elastic strength of the wire. Possible improvement lies either in such treatment of the tube that its elastic limit may be raised at the expense of other qualities considered essential in the built-up gun, or in partial emancipation from the law of elastic overstrain. The tube may be made very thin, and its office reduced to that of a mere core for the winding and medium for carrying the rifling. All that may be required of it is that it shall stay in its place, affording no assistance to the strength of the structure, which is amply secured by the wire.

Whether or not under these conditions the tube will remain intact when subjected to alternating strains greater than its elastic limit is a matter to be decided by experiment. Those of Woehler and Bauschinger indicate that if strained without support through a range much greater than the elastic extension in one direction only, it would ultimately give way; what would be the result if supported by an envelope with a large reserve of strength is unknown; but the superior ability of the wire to hold it together after it has ceased to afford any assistance itself, furnishes the hope of the ultimate, though perhaps slowly progressing, substitution of wire for a part of the forged-steel envelope.

The indications are that the art of gun-making has so far approached a science that future improvement will be a growth, and that the day of radical new departures is passed.

CAPTAIN ROGERS BIRNIE, ORDNANCE DEPT.—In closing this discussion the lecturer wishes first to remark that his advocacy of the built-up forged-steel gun is based upon the belief that it is pre-eminently the gun of the present; also that it is a good gun, and if a seacoast armament is to be provided, the present development of this system of construction affords an opportunity for going to work at once. Experiments are costly and tedious, and may be made unending. When once a satisfactory degree of excellence has been reached the results should be made available. No one will pretend to say that this gun of to-day is the ultimatum of science, or that experiments and tests of promising systems should be discontinued. I am not opposed to tests of steel-cast guns, but hope they will be sufficiently tested to establish their true status. The argument is directed chiefly against the delay and procrastination which must be ever present with us if we continue to defer making guns in quantity so long as plausible designs continue to be put forward.

The lecturer finds many points of agreement with Major Campbell in his admiration for the grand civil establishments that exist in other countries for the manufacture of Ordnance, but it will scarcely be denied that each of these establishments is provided with a special corps of Ordnance designers and manufacturers, and that such men are the more valuable in proportion to their experience. Equally so is it necessary to have an experienced and trained body of officers who may intelligently represent the interests of the Government. In every country officers are especially assigned to such duties, whether by one designation or another, and I believe that an organization of

this kind is the more effective and useful in proportion as its personnel is able to devote the most exclusive attention to its special duties. Knowing full well the devotion to duty which actuates Major Campbell himself, I must ask him to credit the same spirit to others of his profession, and disabuse his mind of the suspicion that in any path of duty their existence is or can be "equally comfortable in failure or success." The number of mixed Boards that have been appointed in late years to control questions of armament, and even the designs of the guns to be manufactured, does not permit one to say that any special Corps has controlled the question. So far as contemporaneous records teach us, the policy of the Government is to encourage both the making of steel and the fabrication of guns by private manufacturers.

The lecturer must dissent entirely from the view advanced by Dr. Woodbridge that dangerous initial strains will be found in gun-hoops of steel as now manufactured in this country. Careful experiments have proved that no initial strains existed in a hoop taken from the ordinary run of manufacture, and there is otherwise no proof of their existence; on the contrary, the actual firing tests of many hooped-guns and extended experiments show that the hoops, which are carefully inspected before acceptance, are uniformly reliable.

The objection which Dr. Woodbridge makes to the statement referred to on page 22 appears to be based on a curious misapprehension of the meaning of the word inert as used in the text. The nearest approach to the "inert" lining tube that we have in practice is that of a split tube. Such a case is exemplified in the experimental 8-inch rifle converted from a 10-inch Rodman gun by lining with a steel tube, breech insertion. (See table, page 26.) The gun endured 281 rounds after the tube was cracked. The theoretically inert-tube—that is, inactive as regards tangential resistance, which is the plain meaning of the text—is one conceived to be divided longitudinally by any number of meridian planes.

It is a pleasure to discuss the able and pertinent criticism in regard to "range of elasticity" contributed by Mr. Cooper. The comparatively small amount of knowledge that exists on this subject certainly ought to be enlarged by extended experiments. The lecturer does not hesitate to admit the force of this criticism in the sense that he has neglected to take into account the laws indicated by Woehler's and Bauschinger's experiments:—That there exists a "range of elasticity" under incessant changes of strain which, probably for all metals, is less than the sum $(\rho+\theta)$. In practice, however, a number of compensations occur which must be considered. Taking the example quoted in Appendix B, for instance, it is stated, page 112, that the theoretically safe pressure for the gun is 38,710 pounds, for which the range of elasticity is expressed nearly by the sum $\rho + \theta^* = 40{,}000 + 17{,}067 = 57{,}068$ pounds instead of

* Value given line 7, page 112, corresponding to P = 38,910.

75,000 or 80,000. This results from the direct application of the formulas, and is indicative of the average result. In another view of the case it seems reasonable to assume that the range of elasticity deduced from experiments like Woehler's may be increased in a built-up gun structure. The gun is not subjected to incessant changes of strain repeated millions of times, but to a relatively small number of changes repeated at intervals; and further, in the whole of the structure there is only a zone of metal near the bore of tube which is subjected to a range that would in cases exceed what might be considered a fair value from Woehler's experiments. All the parts (cylinders) exterior to the tube act within a range that even in the cylinder next the tube seldom equals the simple limit expressed by the symbol θ. That present practices are not dangerous seems to be amply proved by the endurance of hooped guns. I believe there has occurred no instance of the bursting (splitting) of a steel-hooped gun through the reinforce.

Assuming a "range of elasticity" for the gun-steel to have been determined experimentally: No fundamental changes of formulæ need follow. There would at most be a change in the value of physical constants for the tube. In certain cases there would follow a restricted value of P_0, but in the majority of cases the theoretical value of P_0 as now deduced, would not be lowered. And there would, in any case, still remain the superiority claimed over others for the built-up steel gun.

The several quotations made by Mr. Haskell from the paper under discussion warrant the belief that the intention of the lecturer to give an account of the best performances and most favorable results from the past trials of the multicharge system has been appreciated. A statement now elicited is that the 6-inch gun tested at Sandy Hook, in 1884, represented the outcome of the labor of thirty years, and the expenditure of $300,000 in experiment and construction. Under these circumstances the presentation of the plea that the gun was made of weak material lays all the burden of the argument upon its advocates. The reasonable supposition is that the question of strength in this system was considered a matter of secondary importance. However that may be, the argument I have made that the question of strength in this gun is of primary importance loses none of its force. The 6-inch gun failed after a comparatively few rounds. As regards the question of strength, the gun therefore remains in the category of systems that have been tried and have failed. Relatively low pressures in this gun form no criterion for a comparison of its strength with single-charge guns. Whether cast solid or built-up, or by whatever method this gun be constructed, the irregularities of form and the attachment of the pockets, for which the tube must be cut through in several places, present numerous sources of weakness.

The ballistic effect realized from the 6-inch multicharge gun would be a more pertinent subject for discussion if the strength of the system had been established. In discussing this question at any time, however, a rational method embracing all its bearings should be adopted. Fair comparisons do not consist in selecting one element out of many, as Mr. Haskell does. But even on his own ground: The 6-inch Armstrong ribband-gun, weight three tons, and the 6.3-inch Spanish gun, weight six tons, had each, at a prior date, given a higher muzzle energy than the best record of the 6-inch multicharge weighing twenty-five tons. The range of two guns at low angles of elevation affords no measure of their comparative power. All sorts of absurd deductions would follow from such a premise, *e. g.*, the comparison which Mr. Haskell attempts to make between the 6-inch multicharge and the heavy caliber Krupp gun. In this case, moreover, taking the 111-pound shot with which the stated range of the multicharge gun was obtained, the comparative ability of this and the Krupp projectile to overcome the resistance of the air, is largely in favor of the Krupp. An approximately fair comparison could be made in this way in case the maximum range alone, to be obtained with each gun, were considered. Taking the case of two projectiles fired from the same gun, one of light weight and the other heavy, and the muzzle energies of the two supposed about equal: The light shot would give the greater range at small angles of elevation, while the heavy shot, owing to its greater sectional density, would give the greater maximum range, and also greater penetration and effect at any given range. When a projectile strikes a target which it cannot penetrate, it is brought to rest by the resistence of the target, and the whole of the stored-up work in the projectile is exerted to overcome the target. In its flight through the air, as in firing for range, the resistance of that medium acts as a retarding force only, and the effective work of the projectile is principally used up by the resistance of the earth on striking. It is apparent, therfore, that the thickness of the wall of air (*i. e.*, the range) through which a projectile passes does not afford a comparative measure of either the penetra-

tion or striking energy of the projectile on reaching a compact resistant material which absorbs the momentum of the projectile within a path limited to a few feet or less in length. The proper measure of effect can only be based upon the remaining energy at any given distance.

Captain Michaelis appears to have been led into error in comparing the features of construction in the Krupp gun with our present designs. The two are in the main similar. In the latter the jacket constitutes the block-carrying cylinder, and performs the same functions as the corresponding piece in the Krupp gun. In neither case is the closure seated in the tube, which is thus relieved from the longitudinal strain due to the pressure on the breech-block. In reply to Captain Michaelis' remarks upon the success of cast guns in Sweden, I will refer to Commander Barber's remarks upon the same subject, which are published with this discussion.

Captain Butler presents, in a new and interesting light, the authorship of the designs of certain guns which he names. Ungenerous treatment on my part towards himself can evidently not be substantiated, since he has here, for the first time, so far as I know, divulged the nature and extent of a private and confidential compact made with Mr. Hunt. He states that Mr. Hunt is indebted to him for the designs of these guns. I am the more pleased to be able to call attention to this because, in claiming credit for work done by officers of the Ordnance Department, Captain Butler can by no means be left out. His careful and able work in the improvement of methods for attaching expanding sabots to the base of the muzzle-loading projectile has alone given him a wide reputation.

A letter dated Washington, March 3, 1887, signed Wm. P. Hunt, President South Boston Iron Works, was published in the *National Republican* of March 4, 1887. I take from that letter the following extract:

"In short the Getty Board gave me credit over all others for my design for a steel-breech-loading rifle, and recommended that a 10-inch steel rifle be made after my design. With this diploma, I ventured to present my design for a cast-iron 12-inch Rodman rifle to the Select Committee on Ordnance, of which Gen. Logan was chairman, and offered to make such a rifle at my own cost and subject to a firing test of 100 rounds, with charges of 150 pounds of powder and a 700-pound shot, and produce a muzzle energy of 10,000-foot tons * * I then entered a contract for five heavy guns, as follows:

"One 12-inch breech-loading Rodman rifle, entirely of cast-iron."

* * * * * * * * * *

"These guns were all designed by the Ordnance Office. I found that my design, as given to the Logan Committee, had been increased in weight from forty-five to fifty-four tons. This extra weight was placed mostly at the breech. Although the entire length has been increased two calibers, the thickness of wall at the muzzle was left the same. I found that my design, which provided for 150 pound charge, was changed so as to provide for 265 pound charge." * * * *

From the information Captain Butler now gives, we learn that Mr. Hunt only spoke of "my design" in the sense that these designs were the property of the South Boston Iron Works. It is gratifying to know that the credit for them attaches to an officer of the Ordnance Department. It leaves the South Boston Iron Works with the credit of having made an excellent casting for this 12-inch rifle—which all will freely admit. Mr. Hunt gives the credit for the design of this gun as actually made to the Ordnance Office, and in this respect is more generous than Capt. Butler, yet I may not do other than admit that had the latter been on duty in the Ordnance Office in place of the offi-

cers* who were there at the time, he might have contributed equally well to the result accomplished.

It may not be denied that enormous pressures recorded in the trials of cast-iron rifles, which are inconceivable when regarded as a register of the true *pressure* in the bore, have been repeatedly used as an argument in their favor. In the table given, page 126, Getty Board, the compilation of which it appears is due to Capt. Butler himself, there is a selected record of twenty-seven pressures, of which eleven exceed 98,000 pounds, and no doubt is thrown by the compiler upon the authenticity of two records of 150,000 pounds, two of 200,000 pounds, and one of 240,000 pounds. Is it not reasonable to suppose that the pressure-guages were more truthful in their record on June 14, 1870, when the following results were obtained? Seven rounds were fired on that day from 8-inch rifle No. 2, rounds numbered 836 to 842 inclusive; the charge throughout was fifteen lbs. of powder with Dyer solid shot of 150 pounds weight, and the pressures were, respectively, 21,000, 30,000, 23,000, 25,000, 18,000, 25,000, 28,000.

Individual opinion is I suppose, always open to the charge of being influenced by prejudice. However, if the facts of a given case are substantiated, the public may judge for itself, and, noting that Capt. Butler has not refuted any of the facts upon which were based my unfavorable conclusions upon the merits of cast-iron rifles, I am satisfied to let the opinions stand for what they are worth. The principal causes which led to the cessation of the manufacture of cast-iron rifles in this country were the findings of the Select Committee on Ordnance 1869, and the unfavorable results of the trials of guns which I have authentically given, and no defense is needed for stating these plain facts of history.

In conclusion I will express my thanks for the kind appreciation of the gentlemen who have taken part in this discussion, and, at the same time, my regrets that I have been unable to discuss more fully the arguments made for and against the views presented in the lecture.

* The writer was "employed elsewhere" at that time, and took no part in the alterations and improvements made in Mr. Hunt's, or rather Captain Butler's, design of the gun in question.

CORRESPONDENCE.

MORE CANADIAN MILITIA NOTES.

(From a Foreign Correspondent of Council.)

PERMANENT CORPS AND GARRISON BATTERIES.

IT is a curious fact, and yet one whioh is in every way undeniable, that even in this nineteenth century, when education is rampant, so that every intelligent man has at least some knowledge of the first principles of almost every science; when it is deemed to be the part of every citizen of a State to take some hand in the affairs of his country, either by exercising the right of speech, or by the use of his vote —it is strange, I say, that the people, nay, the representatives of the people often, are in almost entire ignorance as to the nature of the greatest of all political acts with which the State is concerned.

I refer to the act of War. War seems to us English-speaking people such a very remote possibility, that the preparation for it, the organization of the means for prosecuting it, are questions with which the people hold themselves to be little concerned. I do not, of course, refer to those expeditions against uncivilized tribes living on the borders or in the territory of powerful States, but rather to a struggle for national existence, or for the safeguarding of national independence and the pursuance of national ideas.

This is not the case where great national armies exist, as on the European Continent. Such armies are a national school whereby the true nature of War, its objects and its results, are universally disseminated. But on this continent, where the population is relatively sparse, and where immigration is still desirable, such universal liability to service is not possible, even if it were desirable, and nothing but a thorough and popular Militia system will meet the demands of military defense.

When any attempt is therefore made to increase the standing force of such a country, it can only be justified by the absolute and urgent necessity for strengthening such a force in view of immediate internal or external danger. Such permanent bodies, so long as they are not actually engaged in overawing frontier tribes or disaffected districts, should be considered always as "schools" by means of which the masses of the people—that is, the Militia force, may be trained and educated.

If such schools of military instruction already exist in a country, it is essential that they should be used in this way, and not be converted into a small "*Regular Army*," incapable for good during the many years of Peace. The multiplication of these schools is advantageous up to a certain point, but they lose their value as soon as they consider themselves as "regulars," and not as schools. The instruction in these schools should not, however, be limited to the dull routine of drills and interior econ-

omy of corps ; it is rather to the disseminating of the principles of War as a political act that efforts should be directed, in order that the people may appreciate the full significance of this, the greatest and most important of methods as a means of enforcing the will of the nation, and urging forward the *rôle* of a State in the cause of civilization.

The permanent military force of this country is being gradually increased by the addition of "Military Schools" from time to time. As soon as these institutions forget their proper *rôle* and attempt to develop into mere "regulars," they will at once lose their value.

I have said that a Militia force is the only one which can for the present be suitable to this country, as a means for carrying out War. But such a system has its advantages, one of which has come prominently forward of late.

Our force is an entirely voluntary one, the men enlisting, indeed, nominally for three years, but, in practice, going and coming pretty much as they like. If a corps, therefore, finds itself neglected in the matter of stores and material to work with, it disbands itself. Such has been the case with many of the Militia garrison batteries, of late, and it is an undoubted sign of progress! Just as certain organisms lose their eyes from constant living in darkness where eyes are of no use, so this neglected branch of Garrison Artillery has fallen away by degrees under the action of disuse.

I say advisedly that it is a sign of progress. It clearly proves that the members of these self-disbanded corps are unwilling to remain as useless members of a useful body, and wish rather that the corps should die a natural death by the retirement of its members than the more painful and lingering one of starvation.

One advantage of the voluntary military system then exists in the fact that by such voluntary disbandment the hand of a sleeping executive Government may be forced. Already measures are about to be taken to heal the wounds of the Artillery Corps which remain. Truly a garrison gunner without a gun is almost as ridiculous an object as a hermit-crab without a shell to put his tail into!

But it is not a corps of garrison artillery, as usually understood by that term, that Canada requires. It is rather a body of men trained to manage guns, submarine mines, electric lights, and all the accessories in the defense of a modern coast-fortress, and accustomed to the use of boats and steam appliances. For the ordinary drill required for the proper use of guns of moderate caliber is not difficult of assimilation, and if land-works armed with such guns were to be defended, it would not be impossible to improvise quickly a sufficiently well-trained personnel from among the infantry militia battalions, if instructed officers, which the schools should provide, were available. But the greatest interests of this country lie upon the shores of the lakes and seas, and the modern appliances for the defense of these require the manipulation of a highly-trained personnel. Granted that the material required for the instruction of such a body of men would be expensive, still, by reducing further the present useless garrison-batteries and establishing an Instruction School on a small scale, it is probable that the increased expense would not be of alarming proportions ; at all events the resources of the country would be directed into more useful channels.

But where the members of a voluntary militia display a desire for progress and an unwillingness to remain in a state of somnolent inactivity, and where the Government is moreover willing to enquire into the cause of dissatisfaction, we may rest assured that the energies of the Executive will be directed by those in authority towards the proper goal. The subject of Defense is now again about to absorb the attention of the Militia Department in Canada, and the results are likely to lead to steps being taken of considerable importance. What these steps may be it is impossible for us at present to forecast.

E. N.

A CORRECTION.

WOOSTER, OHIO, March 4, 1888.

TO THE SECRETARY M. S. I.:

Dear Sir:—On page 405, December number of the JOURNAL, in my paper on "Military Training in Colleges," I observe that the quotation marks have been twice omitted, first at the conclusion of the sentence, "War is an occurrence to which all nations are subject, democratic nations as well as others," and again, at the beginning of the phrase, "to cut the knot which diplomacy cannot untie." Dr. Bluntchli has an *i* knocked out of his name, the asterisk and credit are omitted and the word "number" is transformed into "member" on page 409. The first quotation, as stated in the text, is from De Tocqueville, the intervening words are my own (though the thought is as ancient as Greek Philosophy), and the beautiful, heroic figure will be recognized as belonging to the masterly pen of Lieut. A. L. Wagner.

As you will remember, the proof sheets were not submitted to me, owing, as you stated, to lack of time.

In justice to the delightful memory of De Tocqueville, to Lieut. Wagner and myself, I will thank you to publish this correction.

Very Respectfully,

A. C. SHARPE, 1st Lieut., 22d Inf.

REVIEWS.

The Genesis of the Civil War.*

YEARS ago, long before the Century War Series was thought of, it was known in military circles that Gen. Crawford was writing an account of the capture of Fort Sumter.

The work was looked for with much interest, but it failed to appear when expected, and hope long deferred has perhaps somewhat impaired the effect of its late appearance; the book has recently come out, through the publishing house of Charles L. Webster & Co., and is sold only by subscription. A careful examination cannot fail to satisfy the reader that all the time bestowed upon it has been well spent. The collection alone of the valuable data, upon which the work is based, sought as it was from both public and private sources, was a tedious but most important service, and was also a difficult service for Gen. Crawford suffering as he was from wounds received in battle.

When Gen. Crawford's purpose to write a book about Fort Sumter was announced, it was a general opinion among Army men, that it could not be done, that there was not enough in the subject for a book, and that all worth telling could be told within the compass of a magazine article. But Gen. Crawford gives us a royal octavo volume of 450 pages (besides an appendix,) every page of which is full of valuable information, all conveyed in a style so clear and attractive as to give "The Story of Sumter" the charm of a romance. But it must be understood that the author does not confine himself to the story of Sumter; on the contrary he covers the field expressed in his main title, "The Genesis of the Civil War." The part of this work that falls directly under the latter title is not only the largest, but is by far the most interesting. The preliminary steps for secession were taken in South Carolina before the election of President Lincoln, Nov. 7th, 1860, and Fort Sumter was not surrendered until April, 13, 1861. The book therefore covers about six months, probably the most fruitful political period in the history of the country. When we recall how rapidly important events followed one another, and how much of great pith and moment was crowded into that period, and recall also how many great actors passed to and fro across the real stage of the time, performing their varied and potential parts, we can understand why Gen. Crawford's book has grown to its present size. Besides containing a full account of political and military events, the author gives personal sketches of many of the prominent actors, with well-studied analyses of their characters and abilities.

Lest his title "The Genesis of the Civil War" be misleading by suggesting a discussion of the underlying and predisposing causes for Civil War that arose with the formation of the Government, and grew with the growth of the nation, the author ex-

* The Genesis of the Civil War, the story of Sumter, 1860, 1861, by Samuel Wylie Crawford, Brevet-Maj.-Gen., U.S.A., A.M., M.D., LL.D., Webster & Co., New York, 1887.

plains in the preface that he intends his title to cover only those causes of an immediate and exciting nature which, precipitated by the secession of South Carolina, and proceeding unchecked in their course, finally from logical and irresistible conclusion plunged the country into Civil War.

The author thus rules out all discussion of the Slavery and State-Rights questions, and this gives him room to present in the clearest light and in their proper relations the striking events and important facts which fall properly within the scope of his qualified title. This task the author has performed with thoroughness not surpassed by Nicolay and Hay in the "Life of Lincoln," and in a style that cannot fail to satisfy impartial readers North and South, at home and abroad. If the story had been of events that occurred a hundred years ago, or had been written under the obligation of the court-martial oath, to "well and truly try and determine the matter, without partiality, favor or affection," it could not have been told more dispassionately and impartially. While the events are arranged in their proper places, and all the direct lights and sidelights to which they are entitled are turned upon them, there is not a particle of criticism and no expression of opinion in the book. Judicial fairness and cold impartiality reign supreme, and in spite of the rigid exactment of this form of treatment, the work is attractive from beginning to end. Notwithstanding the many temptations of the subject, there is no florid or pictorial writing, and the narrative style is consistently maintained. There is no hero-worship, and perhaps it is a defect in the work that adherence to his rigid rules has forced the author to work in merely as a fraction of the great whole the conspicuous part played by Major Anderson, the commander of Fort Sumter. No fact, however, seems to have been withheld or misplaced that is necessary for the reader with due care and discrimination to learn that Anderson was fully entitled to the high honors that the Government and the public judgment of the period awarded him. Never in the history of this country has a public officer been placed and held by his Government in such a responsible and difficult position. With the end of an old administration and the beginning of a new one, with revolution and Civil War fomenting, and neither administration knowing whether to rely upon conciliation or coercion, whether to pocket insults or resent them, whether to apologize or fight, Anderson, besieged by armed enemies for nearly five months, was furnished with no other instructions than equivocal ones, which at best fixed upon him the responsibility of submitting to humiliation and starvation in the cause of Peace and good citizenship, or of precipitating Civil War by responding to the dictates of public duty and true soldiership.

The Government's part in the matter was nothing more than tentative, and Anderson's part nothing short of heroic. The author does not express this conclusion, but he gives facts that sustain it and says of Anderson when the attack began, "He seemed to realize that upon himself rested mainly the great responsibility. He had endeavored to avert the crisis by every means in his power; he had failed, and the struggle was unavoidable and imminent. His sense of duty now overcame every other consideration, and he prepared to meet the worst." Poor Anderson never recovered from the effects of the crushing weight his Government put upon him. His nervous system was shattered, and his constitution undermined by the unparalled anxiety, care and responsibility to which he was subjected.

Never really fit for duty after he left Sumter, he lingered a constant sufferer until October, 1871, when he died at Nice, aged 66. In character, in fidelity to trust, in conscientious devotion to duty, in patriotism, there is a close resemblance between Anderson and Gordon, the English hero, who was besieged at Khartoum, and though one's death was peaceful and the other violent, both were sacrifices to the indecision and lack of energy of their Governments.

Space does not permit an elaborate review of Gen. Crawford's book; there is but little fault to find with it. In some instances, after giving in his own language correct and comprehensive briefs of official and unofficial documents, the author supplements his briefs by inserting in the narrative the full text of the documents, instead of putting them in the appendix. A reader may think this a defect, but if it is, the defect is due wholly to the spirit of fairness and accuracy by which the author is governed. A few questions of fact or misprint, though of not much importance, may be raised. The author says, p. 452, that Anderson died Oct. 27, 1871, at Nice, Italy. Cullum's Register, hardly ever wrong, and the Army Register for 1872 say he died Oct. 26, 1871, at Nice, *France*. Speaking of the commissioners appointed by the secession convention of South Carolina, the author says, p. 146, "On the 20th of December, the commissioners had their first interview with the President." The commissioners were not appointed until South Carolina had seceded on the 20th December, and did not reach Washington until the 26th. Their first interview with the President was on the 27th, not 20th of December. It might have been more agreeable to the reader if the mode of treatment adopted by the author had permitted him to carry along his account of the various contemporary events so as to keep them more nearly abreast of one another, instead of so frequently turning back to past periods to bring forward parts of the narrative left behind.

Nothing in this remarkable book, full as it is of weighty matter, will more impress the thoughtful reader than its striking exposition of the vacillation and incompetency of President Buchanan, the audacity of the Secessionists, the patience of the Unionists and the General Government, and the wealth of diplomatic language expended by commissioners of various sorts from South Carolina and the Confederacy to the Government of the United States. The failure of the Rebellion, and, as we all see now, the folly as well as crime of attempting to destroy the Union, make the high-sounding Southern diplomacy and defiant eloquence that preceded the outbreak very different reading from what it would have been if the War had ended differently.

"The Genesis of the Civil War" is a book that will find a permanent place in the foundation of the real history of the great struggle which is yet to be written.

J. B. F.

ABRIDGMENT OF THE MILITARY LAW.—WINTHROP.

In a review of this work it will be necessary frequently to refer to that from which the Abridgment is condensed. The Parent work is, in one respect, invaluable. It gives copious and, generally, accurate references. This feature has, indeed, been carried to profuseness, when, as is often the case, the authorities cited are court-martial or like records which have never been published to the Army, and lie buried out of sight, and reach in the files of the Judge-Advocate-General's office. The value of references lies in the facility thereby given to a verification of the text by examining for one's self the sources drawn upon by the author; yet how is one to refer to the records, so frequently quoted, of the "Middle Military Division," "Field Circulars," of armies, etc., mere creatures of the moment, often organized during the War? Another feature of the Parent work is the frequeut citation of the Digest of the Judge-Advocate General's Opinions. This, as is well known, was compiled and annotated by the author of the work under review. For the author to quote the Digest is, therefore, to some extent, to quote himself as authority. But the Digest should never be referred to without a knowledge of G. O. No. 3, A. G. O., 1881, *viz.*: "A misapprehension existing as to the legal force to be given the opinions contained in the 'Digest of Opinions of the Judge Advocate General' recently published, by 'authority of the Secretary of War,' makes it necessary to announce to the Army, and all concerned,

that the authority of the War Department was simply permissory for publication, and did not include an approval of all the Digest contained. Such opinions as are held to be obligatory on military courts, which have been approved by the War Department, have been and will continue to be formally announced to the Army in General Orders." That is our ominous heralding, calculated to make one turn to the Digest as an authority with extreme caution.

In the Abridgment, however, the author has gone to the other extreme, and, eschewing what is most useful in the Parent work, cites almost no authorities whatever. This greatly impairs the value of the Abridgment. Cadets may drink down without question what is given them; but so soon as they leave the academy, they will find it necessary to verify the doctrines of the Abridgment, and will have then to procure the Parent work or some other on military law having those facilities for examining authorizing authorities which their text-book lacks. In comparing the Parent work and the Abridgment, one is led to wish that the energy expended in quoting non-available authorities in the former had been reserved for those citations in the latter absolutely necessary to render it practically useful. In this respect the Abridgment is far behind any text-book on military law used at the Academy for years.

There is an individuality about the Parent work which, whatever one may think of the theories evolved, imparts animation to it. The author gives full swing to his pen, and speaks with the courage of his convictions. The Abridgment, on the other hand, was evidently written under a constraint but illy fitting the learned author, who appears to best advantage in "the discussion of doubtful questions," and in giving opinions "on mooted points." This is well illustrated by what is said regarding the Regulations of the Army in the two productions. It is well known that in the Army the Regulations are contemplated with reverence; the young portion particularly turns to them as the Law and the Prophets—the Alpha and Omega of the profession. With what dismay, therefore, will one so imbued read in the Parent work: "To the student, as well in practice, Army Regulations are the most unsatisfactory element of our written military law. Presented in connection with the statutes from which they are sometimes imperfectly discriminated; not unfrequently themselves partaking of the character of legislation and thus of doubtful validity; and fatally subject as we have seen to constant and repeated modification, their effect too often is to embarass and mislead where they should assure and facilitate." Turning to the Abridgment, he will for the moment have his faith renewed, by finding what he has always deemed well-nigh sacred no longer inveighed against, but, on the contrary, the Regulations mentioned "as law to the Army and those whom they concern, and so far are binding and conclusive;" and that "officers and soldiers, in complying with an authorized Regulation, will be justified in law and protected by the courts." This is sufficiently reassuring were it not for the information—which no one will gainsay—that, if the Regulations contravene law or conflict with constitutional provisions they are without validity, thereby intimating that such invalid Regulations may be promulgated. But these qualifications put us as much at sea as ever, for who is to judge whether Regulations, promulgated by the President through the War Department, do or do not contravene law? Are individual officers to assume that duty?

In the Parent work we are informed that the Professors of the Academy have no rank lineal or assimilated, yet in the Abridgment that they have assimilated rank, which statement accords with the facts? Whence came this later and, presumably, better information? The total absence of authorities bars investigation. Not that the question is of importance, for it is not. These citations are made simply to show the difference between the teachings of the Parent work and the Abridgment.

The position assumed that a court-martial is "exclusively a criminal court," will

not engender chivalric sentiments in military youth. It is not possible to contemplate without grave apprehensions attempts, come from what source they may, to root out the old-time "Court of Honor" idea regarding the nature and functions of the court-martial, the members of which, where the matter is not explained by the Articles of War, are sworn to administer justice according to their consciences, the best of their understandings, and the custom of war in like cases, and to place it on the same plane as a criminal court of the municipal law, where those principles of honor which give lustre to the profession of arms are without either binding force or legal significance.

It will prove a fitting preparation for that frame of mind and confusion of ideas, which may lead officers, as has been felicitously remarked, to act as though "money and honor were mutually convertible." These things make no impression on old soldiers, but they poison the minds of the young. The position that courts-martial are criminal courts only is certainly not made out in either the parent work or the abridgment. It is the boast of military men that courts-martial consider the *substance* of things: that is also one of the fundamental rules of equity procedure as distinguished from the criminal. Courts of the United States, proceeding criminally, take cognizance of those crimes only which have been made so by statute. They do not embrace much that, in terms, is covered by the Articles of War. What would a United States Judge think if it were attempted to indict and prosecute the cadets tried at West Point, not long ago, for being drunk while returning from a military camp? He would open his eyes still wider if the officer in command were brought up for "Conduct unbecoming an officer and a gentleman," and want to know what considerations affecting "an officer and a gentleman" were doing in a criminal court. But his amazement would be complete when the 62d Article of War were thrust at him, and he asked to consider a vast mass of undefined offenses "to the prejudice of good order and military discipline," and would probably remark in stern reproof: "This court knows only crimes defined by statute." The author well characterizes conduct unbecoming an officer and a gentleman as that "which, in dishonoring or disgracing the individual personally as a gentleman, seriously compromises his position as an officer and exhibits him as morally unworthy to remain a member of the honorable profession of arms," but what has a mere criminal court to do with questions affecting honor?

A court-martial is assimilated to a criminal court in this, that it takes no cognizance of civil suits, determines no property rights, nor any questions of personal status in the State, and is limited in its jurisdiction to crimes and offenses declared by the written or the statutory law, or by the common law military, *i. e.*, "customs of war in like cases which cover the customs of Service." But it is not assimilated to a criminal court, as commonly understood, for good morals, honor and gentlemanly conduct are within its jurisdiction, and that which might be only reprehensible in morals, but not cognizable at law in the criminal courts of the country, may be punished with the severest sentence of a court-martial.

An "exclusively *criminal* court" takes cognizance of crimes only. Courts-martial take cognizance of crimes and offenses; the former are the graver delinquencies, the latter run into all shades of misconduct to the detriment of the Military Service, but they are not crimes as defined by, or in contemplation of law. A court-martial is neither a criminal nor an equity court, but a court distinct in character from both: in criminal proceedings it follows the rules of evidence of common law courts of criminal jurisdiction; in its efforts to arrive at truth, however, it disregards the hide-bound technicalities of those courts, and adopts the principles of an equity court; while in other matters, particularly those affecting the honor of the profession of arms, they appeal, if need be, alone to their consciences, their understandings, and the custom of war in like cases.

Attempts to arrange courts-martial into this, that, or the other class of courts of civil judicature can only be productive of melancholy consequences. First, the analogy in subject matter, procedure, etc., which will determine the place of the former in such a classification, is but very imperfectly made out. Second, there is no necessity for any such classification; nor do the exigencies of the Service call for it. Third, it distracts the minds of military men, and generates the belief that principles of honor are, in military courts, to be subordinate to the technicalities of civil procedure.

"A military court," wrote Sir Charles Napier, "should be a Court of Honor; it is a bad system which turns the members that compose it into attorneys-at-law; they lose the frank, soldier-like sense of their duty as members of a court-martial with one grand conscientious duty to perform—that of acquitting the prisoner against all legal rules of evidence, if they believe in their hearts that he is innocent; and condemning him, if they conscientiously believe him to be guilty. In short, the business of a court-martial is not to discuss points of law, but to get at the truth by all means in their power." Clode says: "In subordination to this principle (*viz.*, that every man is to be heard before he is condemned), the court, it must be remembered, is one of 'discipline and honor.'" These are the time-honored views held in that proud Service and great nation whence we draw the principles of our Military Code.

May the day never come when the doctrine is accepted in our Service that a court-martial is but a mere *Criminal* Court. When it does, never again will be repeated the words of a distinguished jurist and Senator who, speaking on the occasion of an impeachment which nearly affected the honor of the military profession in this country, exclaimed in chaste and elegant metaphor, "The Army and the Navy are the spotless lilies of the Republic!"

If, by no unusual incident of service, one should belong to a post of which the commander was junior in rank to himself (Abridgment p. 56), it would not be conducive either to comfort or peace of mind if he should, on that account, deny the right of such commander, should occasion arise for so doing, to place him in arrest. Notwithstanding any poor opinion of Army Regulations he might entertain, he would probably find out that paragraph 864 was still in force. The authority of the commanding officer is supreme at his post: it extends to all on duty with the command, no matter what their relative rank; any other idea is subversive of all discipline. The present Superintendent of the Military Academy would hardly hesitate to command for every purpose—even that of arrest—one whose assimilated (whatever that may be) rank of Colonel antedated his own.

It is remarked that the action of the President "in approving or confirming sentences of courts-martial may legally be authenticated by the signature of the Secretary of War in lieu of his own; the act of his Minister being *his* act in law." The restoration of Major Runkle on a decision of the Supreme Court (122 U. S., 543) that "the fact that the order of dismissal was the President's own act should not be left to inference only," has carried conviction very generally that the author, in this instance, mistook the law. The case of this officer was supposed by our author to have established beyond quibble that the views as to the sufficiency of the Secretary's signature in court-martial cases just quoted enunciated the sound Constitutional doctrine. The contrary decision of President Hayes is characterized as "extraordinary," and his "exceptional action" is declared by the author to have been "effectually repudiated." The Supreme Court, however, "effectually" sustained the President. The Runkle case, the doctrines of which are adopted in the Abridgment, was one of the pillars of the Parent work. The Supreme Court, in depriving it of this support, has seriously impaired the stability of the author's system of military jurisprudence.

The proposition that reviewing officers, acting under authority conferred by the

112th Article of War, are (Abridgment p. 202) "the agents or representatives of the Executive in military cases" seems inaccurate in law and logic. That Article gives every officer who has authority to convene a court power to pardon or mitigate any punishment adjudged, except the punishment of death or of dismissal of an officer. When the officer pardons or mitigates as here authorized, he derives his authority directly from the same source as the Executive does his, *viz.*, the Constitution, or laws made in pursuance thereof, and acts as the agent or representative of the law, not of the Executive. There is no official placed intermediary between the law and the officer. The latter acts by virtue of original authority conferred by law, and not as the agent of any person or any branch of government. If the officer be the agent of the Executive, the latter could, by the principle governing such cases, withdraw the authority to pardon or mitigate; or, could divest a public officer of the powers expressly and pointedly conferred by law. This seems to be pushing the doctrine to an extreme.

One who had read in the Parent work the views of the author on the applicability of the statute of limitations (103d Article) to the offense of desertion, and who is alive to the practical importance of the subject, would natuarlly turn with interest to find what treatment it receives in the Abridgment. To begin with, the very satisfactory announcement is made that the War Department has determined that desertion is a continuing offense. The practice of the Service happily is in consonance with this. It were well had the Abridgment stopped here. But no; the salutary doctrine is no sooner announced than it is hedged about with limitations that render it of little practical value. "The status, to constitute an impediment in the sense of the Article, must be one which precludes the military authorities from subjecting the party to the military jurisdiction. The mere fact that such authorities do not know, and cannot for the time ascertain, where the deserter is, will not constitute an impediment. Nor will a concealment of himself or of his identity by the deserter, or other fraud practiced by him, have such effect (Abridgment, p. 103)." The almost universal practice in the Army is flatly at variance with these views. The cadet, taught at West Point that a man who leaves his command, conceals himself, obliterates all traces of his whereabouts, and fraudulently deprives the Government of those services which he has contracted to render, but who, nevertheless, is to be given the benefit of his own wrong, will, upon entering the Army, find out that different ideas prevail there; that the War Department, the General of the Army, nearly, if not quite all the generals commanding divisions and departments, repudiate the doctrine; that the practice of courts-martial is directly opposed to it, with rare and isolated exceptions; and that concealment and fraud are not at a premium, but, on the contrary, that deserters who resort thereto are, upon apprehension and trial, sent promptly to Coventry. He will find that this doctrine of immunity from punishment for evil deeds is confined to the—to him—sacred precincts of his Alma Mater. He will probably ask himself why this is so; why he was there taught doctrines which the Army, almost with one voice, rejects as unsound. It will be difficult for any, the wisest, to give satisfactiory reasons for the anomaly.

In the Parent work [1250 pages Royal 8vo], the author roams at large over the field not only of military law proper, but also all other subjects in any—the remotest degree—allied thereto. The Abridgment is an image, in miniature, of its prototype. But as it is for the use of Cadets, remarks therein bringing in question the constitutionality of the Articles of War look oddly out of place. It would seem proper that young gentlemen should be taught only to obey the law, and unhesitatingly accept the Articles of War as their rule of conduct, without bothering their heads concerning questions of constitutionality. So with regard to orders. They should be taught to obey cheerfully, implicitly. To them all orders should be lawful. The best thing

that West Point does for the Army is to discipline its officers—using that term in the broad sense, as affecting both body and mind, in which it finds application in active army life. It cannot but be seriously impaired if the Corps of Cadets is turned into a debating school to pass upon the legality of orders received. Their business and duty is to obey, and *never* question.

The 60th Article (the constitutionality of which, Abridgment p. 298, is questioned) does not furnish the only instance in which an ex-military person is held subject to military authorities, after he becomes a civilian, that is true of every man who is discharged in pursuance of a court-martial sentence, yet held to a term of labor afterward; and, as to the inmates of the Military Prison, nearly all of whom have been discharged from the Service, and the inmates of the Soldiers' Home, the law in express terms renders them amenable to the Articles of War. A text-book for Cadets does not seem to be the fittest place for bringing in questions of the constitutionality of laws enacted either to guard the fair fame of the military community, or to hold in due subordination those subject to military control. Leave that for the courts, duly authorized, to attend to.

The views advanced in the Abridgment (p. 301 *et. seq.*) regarding the offenses taken cognizance of under the 62d Article of War, cannot pass unnoticed. That Article is a drag-net, intended to catch all the fish that slip through the meshes of the other Articles. The words "All crimes not capital, and all disorders and neglects, which officers and soldiers may be guilty of, to the prejudice of good order and military discipline," would seem to be comprehensive enough to embrace every delinquency. So they are if a construction were not given them in the Abridgment, which fatally limits their applicability. Everything hinges on what is compreheneed by the words "to the prejudice of good order and military discipline." The author takes the view that "the prejudice must be near and direct, not merely indirect and remote." The reverse of this rule, *viz.*, that the prejudice need only be remote, and need not be near and direct, is that which is accepted almost universally in the Army. The words (p. 277) "*directly* prejudiced good order and military discipline" qualify the 62d Article of War in a manner that has no warrant in law. All in the military service should be made to feel that they are responsible to their superiors for their conduct. If that conduct, indirectly and remotely even, prejudice discipline, those whose duty it is should take the necessary action. Let the idea be disseminated in the Army that civil courts, to the exclusion of the military, are to be intrusted with its discipline, under the construction given the 62d Article in the Abridgment, and the result will prove unfortunate. The Army is not the place for the uplifted hand of Justice to be stayed, while the civil and military courts discuss nice questions as to whether or not conduct —acknowledged to have been prejudicial to good order and military discipline—is so in a remote or direct degree.

This is another occasion when the rules of municipal law proper as to the proximate or remote cause of injury can only do harm if adopted by the military service. To a profession which makes honor its code of law, all that taints it is a direct injury, and no other idea can be tolerated.

Amid so much to which exception is taken in the Abridgment, and a few features of which have been remarked upon, it is pleasant to commend the synopsis given of the Law of Evidence—that legacy of concentrated common-sense, bequeathed by man to man, aptly called "the perfection of reason." The arrangement of the subject-matter is logical, the language exact; altogether, the treatment of this important subject is perspicuous and luminous, and cannot fail to make this part of the work valuable to those for whom it is intended.

After perusing the Abridgment we are reminded that no matter, how profound

may be the knowledge of common and civil law, how much so ever erudition may give facility to the pen, and variety to illustration, yet how difficult it is to produce an acceptable work on the subject of the Law-Military, if there be wanting an appreciation of the *nature* and *importance* of DISCIPLINE—the palladium of the military system.

REMINISCENCES OF WINFIELD SCOTT HANCOCK, BY HIS WIFE.*

This is a very agreeable, interesting and instructive book; deserving, by the lessons it teaches, of the study of every officer of the Army.

It claims no equality, of course, and it would be absurd to compare it with works of a heavier caliber, such as the "Memoirs of the Duke of Sully" and the "Life of Sir Charles Napier," by his brother. Without a familiarity with these no education is in any sense complete, and both, but especially the last-named, should be published and re-published until every soldier shall have made himself master of their contents. The book under review is no such work as these, but is, as it is rightly designated on its title-page, a Reminiscence only, though a most valuable reminiscence, of the more prominent incidents in Gen. Hancock's life, and of the more conspicuous features in his character, written by a most loving hand, from an interior and domestic point of view, and developing principally those traits in the nature of a great and patriotic soldier which are apt to escape the record of the general historian.

It is to be regretted, we think, that the author has deemed it advisable to express so strongly as she does her husband's views on certain political subjects, which have now long passed into the limbo of forgotten questions. It would have been better had she refrained from discussing the execution of Mrs. Surratt, for instance, and from casting upon the Court-martial, the President, the Secretary of War, and the Judge Advocate-General of that day, what she hastily called the "odium" of that act. Her sentiments, too, upon the general reconstruction of the Rebel States, and especially upon the transactions in New Orleans at the time Gen. Hancock issued his famous Order No. 40, when, with such lavish hand, he restored to the still recalcitrant Southern people the power they had for four years undeniably abused, and were then scarcely yet fitted to resume, may well have been expressed in less decided terms.

These, however, are blots upon the book which can be readily overlooked, and do not impair its general interest and merit. It carries the reader along with the General and his family from his marriage in 1850, to his death on Governor's Island in 1886; and is filled with striking incidents of his varied and useful life. Gen. Hancock's courage was conspicuous and unquestionable, and is well illustrated in this memoir. His cheerfulness, too, under adverse circumstances, under frequent changes of duties, under the disappointments of an honorable ambition to which he was not rarely obliged to submit, was not the least noticeable characteristic of his nature. What would be said and felt now-a-days by an officer's wife were she to find that the quarters in which she was expected to live, were "untenantable, hingeless and keyless, necessitating nailing up the doors at night?" Yet this was the condition of affairs with the quarters assigned Lieut. Hancock and his wife at Jefferson Barracks in 1852, all remedy, moreover, being refused, and on the most frivolous grounds, by the Post Commander, Col. Bragg; nor was it until several wretched weeks had passed, and Gen. Clark, the Department Commander, had personally interviewed, that the Hancock dwelling-place was put into decent order, and this, too, at the cost to Gen. Clark of a subsequent standing quarrel with Col. Bragg, who regarded and spoke of him as an insolent intruder.

* CHARLES L. WEBSTER & CO., 1887.

Yet through these and many equally trying circumstances, Lieut. Hancock seems to have preserved his equanimity; and, if not he, that Mrs. Hancock did is put beyond a doubt by the one in which she writes about her difficulties now. There are men in this world of ours, and more women than men, who, in their extreme pity for their own misfortunes, illnesses and vexations, are incessantly reaching out for audible expressions of sympathy, and protesting against the injustice of Providence by pouring their grievances into the reluctant ears of their friends, until pity, or the utterance of it, ceases to be possible, and the listeners are driven at last into unfeeling flight.

Such were not the Hancocks. Cheerfulness, patience, silence—above all, silence—under trial and annoyance, seem to have been the golden rules of their domestic life; and hence, in great measure, sprang the perfect domestic happiness which the author describes as reigning unbroken, notwithstanding many sorrows and disappointments, over their entire married life. Many an officer's wife can, in this respect, draw a lesson from the book which will add four-fold to the happiness of her home. Unhappily, as we never learn wisdom from the experience of others, and very rarely from our own, our advice under this head is probably thrown away.

Of the discomforts so cheerfully endured by the Hancocks there is not room to speak in detail. The reader must study for himself the author's descriptions of the frequent changes of station; the long marches; the dangers from Indians; the wretched oustings from quarters, where, for instance, the arrival of a ranking officer at the post, on one occasion, turned out twenty families at one fell swoop; of the voyage to Panama with 1150 passengers, and the voyage to California with 1750; all struggling, fighting and mutinying like imprisoned rats in a cage, and six of them, on one occasion (incredible as it appears), sought to involve Lieut. Hancock in a quarrel, in which it was intended to take his life, by dragging little Russell Hancock, then nine years of age, "from one end of the deck to the other by the hair of his head!"

A description given by the author of a Western volunteer military court, will perhaps reconcile some among us to the existence of the present Bureau of Military Justice, against which growls are occasionally heard on the score of its precision and rigidity of form and practice:

"A court-martial, composed entirely of volunteer Kansas officers, was assembled for the trial of an orderly sergeant charged with stabbing a regular soldier. The regular officer in command had loaned the court Macomb's work on court-martial, in order that some system might be observed in the conduct of the trial. On visiting the court-room to see how they were progressing, the president apologized for the doors being shut, saying that he knew the book said the court should sit with open doors, but as the weather was very cold, he had ventured to close them. The prisoner had removed his coat, and in his shirt sleeves was walking up and down, shaking his fist in the witness's face, denying in forcible language all he said, and forbidding the court to enter it on the record. The members of the court would interfere by saying: 'Now, John, don't, don't. We'll make it all right.' The court-room contained a jug of whisky from which all might imbibe at pleasure; and all, including the prisoner, had pipes in their mouths."

The author goes on to describe how the prisoner was found guilty, and advised, by the president, to leave, which he did, taking with him the best horse in the company. Few, we think, will contend, after careful reflection upon this incident, that the system introduced into military trials by Gen. Joseph Holt, and continued by Gen. Drum and Col. Lieber, have been injurious to the discipline of the Service, or, as a whole, has tended to defeat and hamper the decorous enforcement of law in the Army.

The author says, in her touching preface: "My husband's character was one of such noble simplicity and directness as to be better illustrated by his own deeds and

utterances than by any words that might be written ; and these imperfect recollections of a life that was so conspicuously marked by unselfish ambition, grand achievements, the purest patriotism, and the most conscientious adherence to truth and right at all hazards, must derive their interest from the person to whom they relate, and depend, in but slight measure, on the manner of the telling."

The manner of the telling, however, notwithstanding this modest disclaimer, is as pleasant as the interest of the subject is great, and is marked by the easy grace and lucid language which many men strive all their lives, without success, to attain, but which seems to flow instinctively from the pen of every educated woman.

The book is admirably and copiously illustrated with steel-plate and wood portraits and views, and is clearly printed upon broad and attractive pages, with ample margins. We cordially commend it to our readers.

H. P. C.

"STANDARDS OF LENGTH AND THEIR PRACTICAL APPLICATION."

This little volume edited by Mr. George M. Bond, M. E., and published by the Pratt & Whitney Company of Hartford, Conn., details the methods employed by that company, through Prof. Wm. A. Rogers, of the Cambridge Observatory and Mr. Bond, in the production of standard gauges in order to insure uniformity and interchangeability in every department of manufactures.

The necessity for standards of length is clearly set forth in the report of the committee of the Master Car-Builders' Association at the annual convention held in Philadelphia, in June, 1882. In this report a description is given of the various systems of screw-threads in general use, that is, the ordinary V thread, the Whitworth and the Sellers, and the reasons for the adoption of the latter by the Franklin Institute.

The report proceeds to state that soon after the organization of the Master Mechanics' Association, it recommended the Sellers' system for use in locomotive construction, and that in 1871 the Car-Builders' Association recommended it for cars.

It was found, however, that the mere adoption of the system was not a panacea for all the ills that the car-repairer was heir to, for a nut made at one shop would not fit a bolt ostensibly designed for it at another.

Examination showed that the standard taps and dies used by different manufacturers differed materially, and that in the case of one railroad at least, those in use in its various shops differed from each other.

It thus appearing that different manufacturers were working to different standards, the Pratt & Whitney Company, than whom none stands higher in this country for the excellence and precision of its products, undertook to work to a true inch and fractions of an inch.

Having procured from various sources what were supposed to be reliable standards of length, they found that none agreed.

The same standards were then measured by the most reliable measuring machines in use, when it was found that no two would measure the same standard alike.

The Company therefore induced Prof. Rogers to co-operate with them in determining standards of length, which should be standards in reality.

A measuring machine having been devised by him, two were made : one for Prof. Rogers' use in his scientific investigations, and the other for that of the company in connection with the manufacture of instruments of precision, gauges, etc.

The report of Prof. Rogers, in which he describes the preparation and comparison of standard yards for the Pratt and Whitney Company with the standard " Bronze II," of the United States Bureau of Weights and Measures, and indirectly with the Impe-

rial Yard of Great Britain, through the medium of standards that had been compared with it, is highly interesting and instructive.

In the prosecution of the work, Mr. George M. Bond was given charge of the measuring machine, and to him great credit is due for the valuable results obtained.

Two lectures delivered by him before the Franklin Institute on "Standards of Length and their Sub-division," and "Standards of Length as Applied to Gauges," constitute an important part of this book which should be found in every machine shop in the country.

J. E. G.

Mercur's "Mahan's Permanent Fortifications."*

The first noticeable feature of this book is that it has not followed the usual rule and expanded inordinately in the process of revision.

On the contrary, there are some omissions as well as additions, and the fact seems to have been appreciated that cadets cannot learn *everything in four years;* but that some things may be best left for the post-graduate course now provided for in all branches of our Service.

Let us see then whether these omitted parts can be well spared: Our old friends, the details of the Noizet Front and the forty-one-days siege, that always resulted in capitulation, and which suggested to Cadet Derby the ingenious plan of moving out of the fort and letting the enemy come in, so as to be sure and have *him* as well as the fort at the end of forty-one days, are not to be found, and, by the average cadet, "They'll not be missed."

Of course the only object of such details is to give some definite models for siege operations, but the engineer must promptly forget them when, as will generally be the case, he has a siege on hand entirely different from the one so minutely described. For example, Gen. Gillmore at Forts Pulaski and Sumter, and Gen. Parke at Fort Macon, evidently forgot all about the forty-one-days arrangement, for they planted their breaching batteries 1,200 to 2,000 yards distant, instead of waiting till they had reached the crest of the covered-way. In fact the latter so far forgot his lesson that he captured the work after only one day's bombardment, leaving the other forty days, or most of them wholly unaccounted for.

The details of "Noizet," although valuable as a problem in drawing were hardly worth retaining; and "Choumara," with his nightmare of parapets, run wild from their scraps, which no one has ever attempted to capture and utilize, might perhaps have been sent after them without any great loss, excepting that all these things have *some* value as matters of history.

If we should build a model fort, with say a dozen successive fronts, beginning with the "Castellated" of the thirteenth and fourteenth centuries, and taking in their order the "Early Italian," "Speckel," "Pagan," "Coehoorn," "Vauban," "Cormontaigne," "Noizet," "Choumara," "Brialmont," and "Polygonal" systems, we may draw the conclusions, first, that in regard to the *plan* or tracé, of forts we are coming around in a circle, through all the complications of bastions and outworks to the plain Polygonal again; and that we may now build our fort of *shape* or *size* we please, securely trusting in Gatling guns, hand grenades, ground torpedoes, and the great range of modern guns, to keep the enemy at a respectful distance, and accomplish all that was formerly attempted by elaborate and costly devices for flank defense. And, second, that on the other hand the *profile* of our works has gone on increasing in im-

* Revised and enlarged, by Prof. James Mercur, U. S. Military Academy. John Wiley & Co., New York.

portance, and is now, especially in our our own country where our forts are chiefly for sea-coast defense. The greatest question that the engineer has to deal with—excepting of course the all-important one of how to get the money to build *any kind* of fortifications.

Accordingly, we find that among his additions the author has given prominence to the uses of armor plating, the Grüson, Dover, and other turrets, disappearing gun carriages, mortar batteries and their accessories, including torpedoes and other channel obstructions. Without attempting to discuss the details of all these additions to the work, we may say that they appear to have been well chosen, and that they are clearly and tersely presented.

The only thing we feel disposed to find fault with is that the plates are folded back and forth so as to be hard to get at or put away, and soon will wear out the patience of the student as well as themselves. They could have been divided, by reduction in some cases, into single page plates and placed opposite the text relating to them (like those in "Laisne's Aide-Memoire," for example,) greatly to the satisfaction of the reader.

W. R. K.

"Official Decision and Changes in Upton's Infantry Tactics."

To those that desire to be accurate in tactical matters, and to whom it may afford satisfaction to keep abreast of the changes that have taken place in our Infantry Tactics under the more recent decisions of the Lieut.-General commanding the Army, this handy little book will surely prove of no small value. It at once possesses the great merit of unquestioned authenticity and its price, twenty-five cents, is not certainly an adequate measure of its value to many officers of the Army, and National Guard. Lieut. Hamilton has, by his painstaking arrangement of these decisions, spared many an officer much tedious and laborious research of the back orders of the War Department.

C. M.

FOR REVIEW.

Official Decisions and Changes in Upton's Infantry Tactics, as authorized by the War Department. Arranged by Lieutenant William R. Hamilton, U. S. Army. (New York.) D. Appleton & Co. 1887.

Standards of Length and their Practical Application. By the Pratt and Whitney Co. Hartford, Conn. 1887.

Glimpses of the Nation's Struggle. A series of Papers read before the Minnesota Commandery of the Military Order of the Loyal Legion of the United States. St. Paul, Minn. 1887.

Mahan's Permanent Fortifications. Revised and enlarged by James Mercur, Professor of Civil and Military Engineering, U. S. Military Academy. New York. John Wiley & Sons. 1887.

Duties of Guards and Sentinels. Compiled and arranged by L. W. V. Kennon, Lieutenant 6th U. S. Infantry. Salt Lake City. 1884.

Reminiscences of Winfield Scott Hancock. By his wife. (New York.) Charles L. Webster & Co. 1887.

OUR EXCHANGES.

[List of Periodicals in Exchange, with titles of leading articles on professional topics.]

BRAZIL.

Revista Militar Argentina. November, 1887.
Fortificacion Rcpida o Del Campo de Battalla Jomini.
[The same, December, 1887.]

ENGLAND.

Proceedings of the Royal Artillery Institution, November, 1887.
A Dictionary of Explosives.
Field Artillery Fire Organization and Discipline.
[The same, December, 1887.]
Siacci's Method of solving Trajectories and Problems in Ballistics.
The New South Wales Artillery.

Journal of the Royal United Service Institution. Vol. XXXI., No. 141.
The Accuracy of Our Service Range-Finders.
Our Ammunition Columns.
Recent Changes in the German Army.
A Brief History of the Royal United Service Institution.

Illustrated Naval and Military Magazine, January, 1888.
Steel Applied to Modern Warfare.
A New Light on Soldiers' Hygiene.
Inventions Applicable to the Services.

INDIA.

Journal of the United Service Institution of India. Vol. XV., No. 69.
Infantry Drill.
Medals and Honorary Distinctions.
The "Field Sketching Board:" How to use it.

ITALY.

Rivista di Artiglieria e Genio. November, 1887.
[The same, December, 1887.]

SPAIN.

Memorial De Artillira. December, 1887.

UNITED STATES.

Scribner's Magazine. January, 1888.
The Man at Arms. I.
The Great Pyramid.
[The same, February, 1888.]
The Man at Arms. II.
The Law and the Ballot.

Harper's Monthly Magazine. January, 1888.
The Italian Chamber of Deputies.
The Share of America in Westminster Abbey.
[The same, February, 1888.]
Socialism in London.
On the Outposts—1780.

The Railroad and Engineering Journal. January, 1888.
The Engines of a New British Cruiser.
Naval Progress of the United States.
Coast-defenses of the United States.
The Rifles of Modern Armies.
[The same, February, 1888.]
Separation of the Passage and Emergency Powers for War-ships.

The Century. January, 1888.
Abraham Lincoln: The Formation of the Cabinet.
Union War Songs and Confederate Officers.
General Edward's Brigade at Spotsylvania.
The Lost War Maps of the Confederates.
[The same, February, 1888].
The Grand Strategy of the War of The Rebellion.
Abraham Lincoln: Premier or President?

St. Nicholas. January and February, 1888.

Outing. January, 1888.
An Army Hunter's Notes on our North-western Game.
Winter Sports at an English Country House.
[The same, February, 1888.]
A Bout with the Broadswords.
Buffalo Hunting on Texas Plains.
Big Game Hunting in the Wild West.

The Popular Science Monthly. January, 1888.
Evolution and Religious Thought.
Sketch of Cleveland Abbe.
[The same, February, 1888.]
Progress at Panama.

Magazine of American History. January, 1888.
Andrew Jackson's Account of the Battle of Horseshoe in 1814.
Fundamental Principles of our Gogernment.
[The same, February, 1888.]
The Stars in our Flag.
A Memory of the Revolution.

Monthly Weather Review. October, November and December, 1887.

The Forum. January, 1888.
The Debt of the Old World to the New.
Defects in Our Consular Service.
Mr. Gladstone's Claims to Greatness.
[The same, February, 1888.]
The Government and the Telegraph.
How Protection Protects.
The Torrid Zone of Our Politics.

Political Science Quarterly. December, 1887.
The Constitution in Reconstruction.
Local Goverment in England.

North American Review. January, 1888.
Two Messages.
John Bull Abroad.
Napoleon's Signatures.
[The same, February, 1888.]
The Genius of Battle.

Science. Nos. 253 to 266.

Transactions of the American Society of Civil Engineers. September and October, 1887.

John Hopkin's University Publications.
Seminary Libraries and University Extension.
University Circulars, December, 1887.
[The same, January, 1888.]
American Journal of Mathematics, January, 1888.
American Chemical Journal, January, 1888.

Ours. December, 1887.
Military fifty years ago.
Incidents of Frontier Campaigning.
[The same, January, 1888.]
Active Veterans.

Proceedings of the United States Naval Institute. Vol. XIII., No. 4, 1887.
Infantry-Fire Tactics, Fire Discipline and Musketry Instruction, and Practice with Rapid-firing Cannon.
Aluminum Bronze for Heavy Guns.

Bulletin of the American Geographical Society. Vol. XIX., No. 4.

The Book Mark. To date.

The Regiment. (New York.) Vol. I., No. 1.

Transactions of the American Society of Civil Engineers. January, 1888.
[The same, February, 1888.]
Steel; Its Properties: Its Use in Structures and Heavy Guns.

Grand Army Review. January, 1888.
[The same, February, 1888.]

The Army and Navy Register. (Washington.) To date.

Public Opinion. (Washington and New York.) To date.

The Public Service Review. (New York.) To date.

Appleton's Literary Bulletin. (New York.) To date.

ANNUAL REPORT.

GOVERNOR'S ISLAND, N. Y. H., *January, 1888.*

TO THE MEMBERS OF THE MILITARY SERVICE INSTITUTION OF THE U. S.

Gentlemen:—The Council respectfully submits its report of the operations of the Institution during the year 1887.

MEMBERSHIP.

The accessions to membership during the year were 86. Loss of members during the year by death was 23, and by resignation 10, leaving a total membership, at the end of the year, of 1,222.

TREASURY.

The Treasurer reports total receipts from all sources, $5,600.51; total expenditures, $3,065.36, which leaves a balance on hand of $2,535.15, including the life membership fund of $901.12 invested in bonds.

PROFESSIONAL PAPERS.

Papers of this class are constantly received from members and others:

For the best essay on the subject of "Our Northern Frontier," the Gold Medal of 1886, with Certificate of Life Membership, was awarded to 1st Lieut. Thos. M. Woodruff, 5th U. S. Infantry.

LECTURES.

During the Lecture Season papers have been read as follows:

"Compulsory Education in the Army," by Brevet Maj.-Gen. J. B. Fry, U. S. A.

"The Place of Mathematics in Military Education," by Professor Henry Coppée.

"Practical Instruction in Minor Tactics," by Lieut. John P. Wisser, 1st Artillery.

"The Pneumatic Dynamite Torpedo Gun," by Capt. E. L. Zalinski," 5th Artillery.

"The General and The Journalist in Time of War," by Mr. Moncure D. Conway, M. A.

"The Attack and Defense of Modern Fortifications, and the Latest Experience and Principles in Modern Sieges," by Capt. J. G. D. Knight, Corps of Engineers.

"Gun-Making in the United States," by Capt. Rogers Birnie, Jr., Ord. Dept., U. S. A.

"Coast Defense—The Armament of the Outside Line," by 1st Lieut. E. M. Weaver, 2d Artillery.

THE MUSEUM.

The collection of relics and trophies for our Museum is growing constantly, many additions thereto having been made during the past year.

THE LIBRARY.

The accessions to the Library during the year, although not as large as during 1886, shows the same to be steadily growing. Total volumes received by contribution and in exchange, 344.

J. M. SCHOFIELD,
Maj.-Gen. U. S. A.,
President.

THE MILITARY SERVICE INSTITUTION.

President.

Major-General JOHN M. SCHOFIELD, U. S. Army.

Vice-Presidents.

Bvt. Major-General JAMES B. FRY, U. S. A. — Brig.-General SAMUEL B. HOLABIRD, U. S. A.
Brigadier-General S. V. BENET, U. S. A. — Bvt. Brig.-General THOMAS M. VINCENT, U. S. A.

Secretary.

Bvt. Brig.-Gen. THEO. F. RODENBOUGH, U. S. A.

Treasurer.

Lieut. E. R. HILLS, 5th U. S. Artillery.

Asst. Secretary.

Lieut. E. R. HILLS, 5th U. S. Artillery.

Vice-Treasurer.

Lt.-Col. HEMAN DOWD, 12th Regt., S. N. Y.

Executive Council.

("Six members to go out by rotation biennially.")

(2 years.)

1. ABBOT, H. L., Col. Corps Engineers, B.-G.
3. COOK, G. H., Captain A. Q. M.
2. HOUGH, A. L., Lieut.-Col. 16th Inf., C.
4. JONES, R., Colonel, Inspector General.
5. MORDECAI, A., Lt.-Col., Ordnance Dept.
6. O'BRIRNE, R. F., Lieut.-Col. 15th Infantry.

(4 years.)

7. BREWERTON, H. F., Captain 5th Artillery.
8. CLOSSON, H. W., Lieut.-Col. 5th Artillery.
9. HAMILTON, JOHN, Colonel 5th Artillery.
10. JACKSON, R. H., Major 5th Art., B.-G.
11. RANDOLPH, W. F., Capt. 5th Art., M.
12. SANGER, J. P., Captain 1st Art., M.

(6 years.)

13. SUTHERLAND, C., Colonel Medical Department.
14. TOMPKINS, C. H., Colonel A. Q. M. G., Bvt. Brig.-Gen.
15. WALLACE, G. W., Lieut.-Colonel, U. S. A. (retired).
16. WEBB, A. S., Bvt. Major-General, (late) U. S. A.
17. WHEELER, H. W., 1st Lieutenant 5th Cavalry.
18. WHIPPLE, W. D., Colonel A. G. D., Bvt. Major-Gen.

Finance Committee.

Generals FRY, RODENBOUGH, and WEBB.

Publication Committee.

Generals ABBOT, RODENBOUGH, Colonel CLOSSON, Major SANGER.

Committee on Library and Museum.

General TOMPKINS, Colonel JONES and Lieut. VODGES.

Memorandum.

The Military Service Institution has published the thirty-third number of its Journal of Transactions; containing the Prize Essays and other Papers submitted to the Institution; an account of its Origin and Progress, and a Catalogue of the Museum. It offers a Gold Medal and Life Membership annually, for the best Essay on a given theme. The War Department has authorized the occupation of commodious rooms on Governor's Island for its Library and Museum, and has ordered the Quartermaster's Department to transport, without expense to the Institution, contributions of books, trophies, or curious relics. The Institution corresponds and exchanges publications with the principal military societies at home and abroad.

Membership and Dues.

(1) "All Officers of the Army and Professors at the Military Academy shall be entitled to Membership *without ballot* upon payment of the Entrance Fee."

(2) "Ex-Officers of the Regular Army, in good standing and honorable record, shall be eligible to full Membership of the Institution, *by ballot* of the Executive council."

(3) "Officers of the U. S. Navy and Marine Corps shall be entitled to Membership of the Institution, *without ballot*, upon payment of the Entrance Fee, but shall not be entitled to vote nor be eligible to office."

(4) "All persons not mentioned in the preceding sections, of honorable record and good standing, shall be eligible to *Associate Membership by a confirmative vote of two-thirds* of the members of the Executive Council present at any meeting, *provided*, however, that the number of these Associate Members shall be limited to two hundred. Associate Members shall be entitled to all the benefits of the Institution, including a share in its public discussions; but no Associate Member shall be entitled to vote or be eligible to office."

Membership dates from the first day of the calendar year in which the "application" is made, unless such application is made after October 1st, when the membership dates from the first day of the next calendar year.

All persons eligible for Membership are urged to join at once, and are urged to recruit for an Institution which has the Military interests of the country at heart.

"*An Entrance Fee of Five Dollars* ($5) shall be paid by each Member and Associate Member on joining the Institution, which sum shall be in lieu of the dues for the first year of membership, and on the first day of each calendar year thereafter a sum of not less than *Two Dollars* ($2) *shall be paid as annual dues. Annual dues* commence on January 1st in each year, and are paid in advance.

PRIZE ESSAY—1887.

I.—The following Resolution of Council is published for the information of all concerned :

Resolved, That a Prize of a Gold Medal of suitable value, together with a Certificate of Life Membership, be offered annually by THE MILITARY SERVICE INSTITUTION OF THE UNITED STATES for the best essay on a military topic of current interest ; the subject to be selected by the Executive Council and the Prize awarded under the following conditions :

1. Competition to be open to all persons eligible to membership.*

2. Each competitor shall send three copies of his Essay in a sealed envelope to the Secretary *on or before September* 1, 1888. The Essay must be strictly anonymous, but the author shall adopt some *nom de plume* and sign the same to the Essay, followed by a figure corresponding with the number of pages of MS.; a sealed envelope bearing the *nom de plume* on the outside, and enclosing full name and address, should accompany the Essay. This envelope to be opened in the presence of the Council after the decision of the Board of Award has been received.

3. The Prize shall be awarded upon the report of a Board consisting of three suitable persons chosen by the Executive Council.

4. The successful Essay to be published in the Journal of the Institution, and the Essay deemed next in order of merit shall receive honorable mention, be read before the Institution, or, at the discretion of the Council, be published.

5. Essays must not exceed twenty thousand words, or fifty pages of the size and style of the Journal (exclusive of tables).

II.—The Subject selected by the Council for the Prize Essay of 1887, is—

"ORGANIZATION AND TRAINING OF A NATIONAL RESERVE FOR MILITARY SERVICE."

III.—It is announced, further, for the information of competitors, that this subject is "to open, for discussion, the general question of how a National Reserve force should be organized, and how it should be trained by Annual Maneuvers with the Regular Army, or otherwise, for immediate Service."

IV.—Due announcement will be made of the composition of the Board of Award.

THEO. F. RODENBOUGH, *Secretary.*

GOVERNOR'S ISLAND, N. Y. H., *Nov. 1887.*

* "All officers of the Army and Professors at the Military Academy shall be entitled to membership, *without ballot*, upon payment of the entrance fee. Ex-officers of the Regular Army of good standing and honorable record shall be eligible to full membership of the Institution *by ballot* of the Executive Council.

"Officers of the United States Navy and Marine Corps shall be entitled to membership of the Institution *without ballot*, upon payment of the entrance fee, but shall not be entitled to vote, nor be eligible to office.

"All persons not mentioned in the preceding sections, of honorable record and good standing, shall be eligible to Associate Membership *by a confirmative vote* of two-thirds of the members of the Executive Council present at any meeting, *provided*, however, that the number of these Associate Members shall be limited to two hundred. Associate Members shall be entitled to all the benefits of the Institution, including a share in its public discussions, but no Associate Member shall be entitled to vote or be eligible to office."